

SEPT 1982

HS-236-0019-1679

E83-10266

NASA-CR-1705

THEMATIC MAPPER

THEMATIC MAPPER

THEMATIC MAPPER



(E83-10266) THEMATIC MAPPER FLIGHT MODEL
PRESHIPMENT REVIEW DATA PACKAGE. VOLUME 4:
APPENDIX. PART B: SCAN MIRROR ASSEMBLY
DATA Final Report (Santa Barbara Research
Center) 533 p HC A23/MF A01

N83-26135

Unclas
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CSCL 14B G3/43

THEMATIC MAPPER

Prepared for
GODDARD SPACE FLIGHT CENTER
Greenbelt, Maryland 20771
CONTRACT NAS 5-24200

FLIGHT MODEL
PRESHIPMENT REVIEW
DATA PACKAGE
VOLUME IV - APPENDIX
PART B - SCAN MIRROR ASSEMBLY DATA

Article IV - 3A

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SPACE AND COMMUNICATIONS GROUP



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Prepared for
GODDARD SPACE FLIGHT CENTER
Greenbelt, Maryland 20771
CONTRACT NAS 5-24200

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FLIGHT MODEL
PRESHIPMENT REVIEW
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PART B - SCAN MIRROR ASSEMBLY DATA
Article IV - 3A

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THEMATIC MAPPER SCAN MIRROR ASSEMBLY

Flight-1 Model Unit Acceptance Test Data Package

MARCH 1961

AEROSPACE GROUPS

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INTERDEPARTMENTAL CORRESPONDENCE



TO: B. Marchant	cc: HS-236 Distribution	DATE: 24 March 1981
ORG: 77-15		REF: HS236-2080
SUBJECT: Flight-1 SMA Acceptance Test Data Package		FROM: N.J. Constantinides
		ORG: 77-31-11
	BLDG: 5	MAIL STA. 8146
	LOC: CC	EXT. 7601

Attached is the Flight-1 Thematic Mapper Scan Mirror Assembly Acceptance Test Data Package. The Data Package includes:

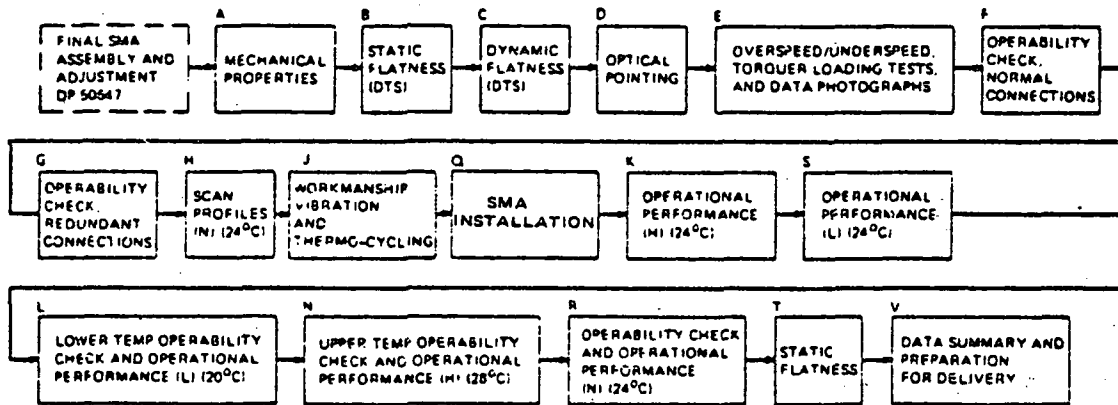
1. A list of the Acceptance Test Discrepancies
2. The Flight-1 SMA Test Data Book
3. The Flight-1 SMA Environmental Reports
4. The Configuration Verification Index
5. The Flight-1 SMA Test Failure Reports
6. The Flight-1 Data Tapes Log
7. The Requests For Deviation/Waivers

The test data acquisition for this SMA model was established as per Test Specification Document TS32015-004, Revision B, and the test event sequence outlined by the blocks of Figure 1.

The Flight-1 test flow event sequence has deviated from that used for the Protoflight SMA in three ways:

- A. A linearity profile baseline had to be reacquired after an Engineering investigation of a Scan Mirror turnaround failure.
- B. A Test Flow Event Q was added in the test procedure in order to assure proper bolt torquing and shimming sequence of the SMA frame upon installation.
- C. A software change was introduced which availed the IFAR acquisition system to reach thermal equilibrium, thereby reducing a small cross-axis error introduced during calibration.

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(a) OVERALL IN N. LI INPUT VOLTAGES HIGH NOMINAL, LOW
DTS = DEVELOPMENT TEST STATION

Figure 1A. Test flow event blocks

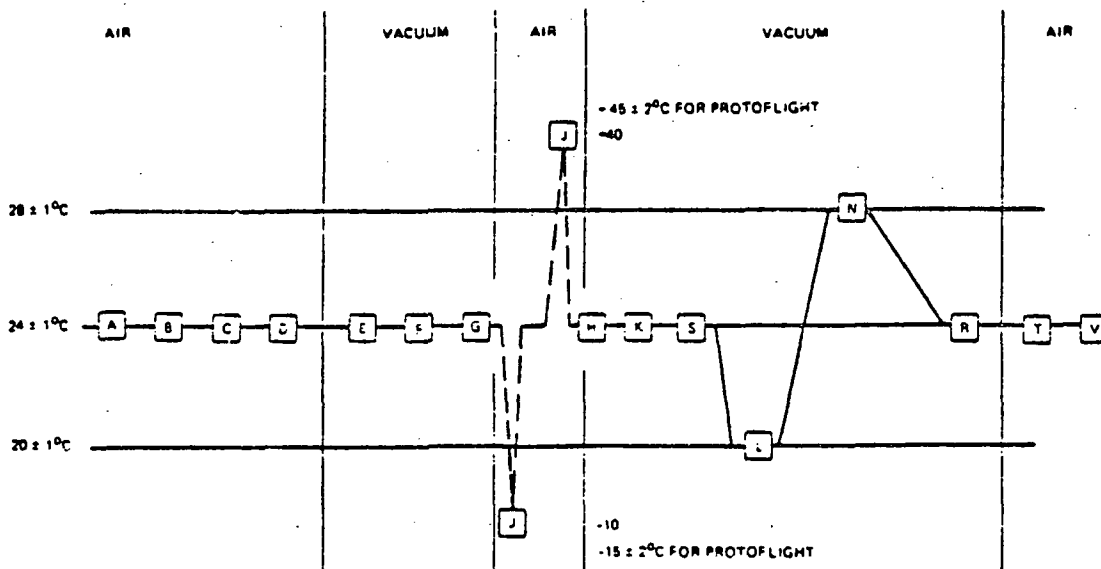


Figure 1B. SMA thermal-vacuum test flow events

Figure 1. Acceptance Test Flow Events & Thermocycling.

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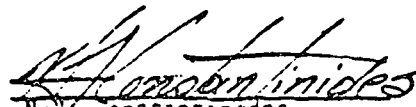
24 March 1981
HS236-2080
Page 3

- D. Test Flow Event H was repeated as TFH Sequence 7 in order to secure a post-vibration baseline for scan linearity.

Deviations referenced by B and C above were captured by Engineering Orders 13112 and 64591, respectively, while deviation D was executed after an SBRC TM Systems request.

For the data user's convenience a block diagram identifying by letter the test flow event sequence is given in the section of this package titled "Table of Contents and Test Flow Event Definitions."

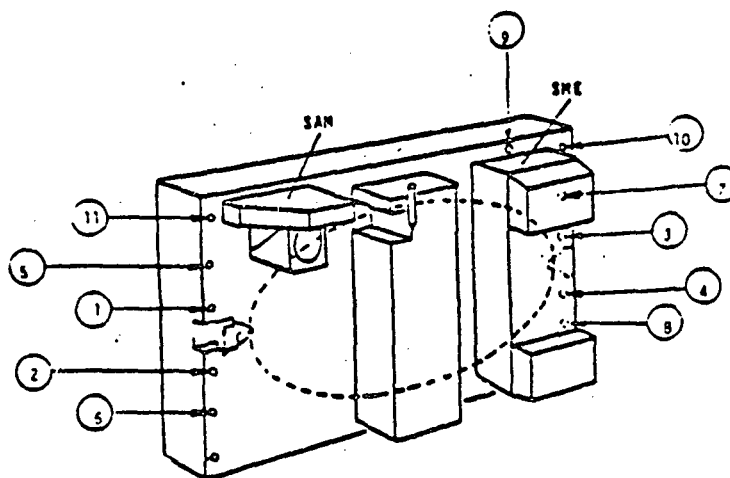
A copy of the Special Test Request form, for the execution of Test Flow Event H Sequence 7 is attached, as is an outline of the procedure for the SMA frame torquing and shimming sequence. The latter is diagrammatically described by Figure 2 of EO 13112 whose purpose of origin is depicted by the FI SMA flatness profile of Figure 3.


N. V. Constantinides
Systems Engineering
77-31-11

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SMA INSTALLATION-REMOVAL CONFIGURATION



NOTE: Torque SMA to TDS fixture
using 30 ± 2 in-lbs.

Order Of Torquing	Bolt # As Defined At SBRC
1	17
2	19
3	20
4	18
5	15
6	13
7	14
8	16
9	8
10	12
11	10

Figure 2.

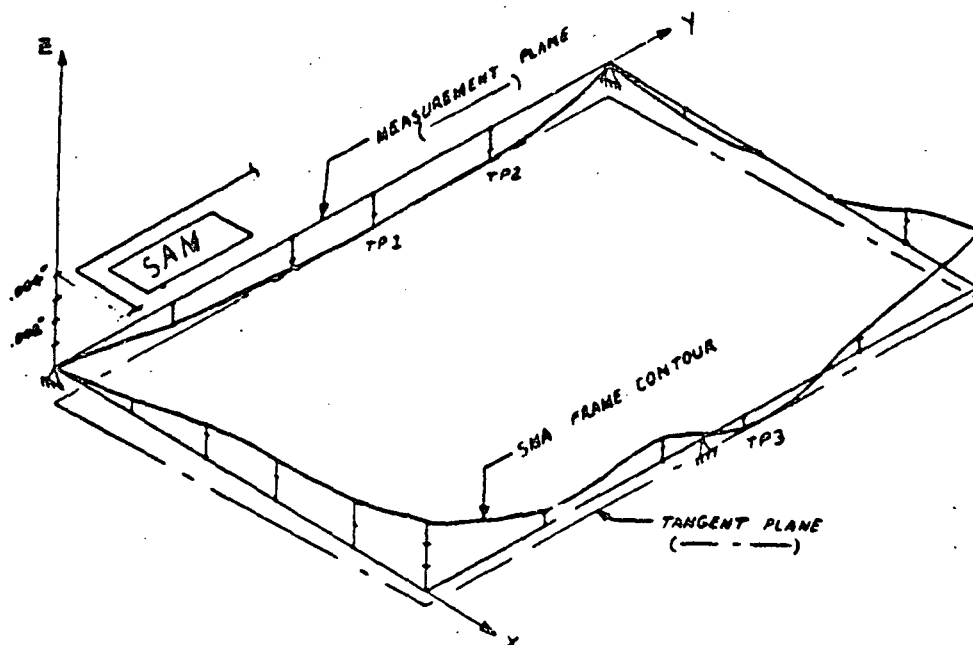


Figure 3. F-1 SMA Flatness Profile.

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PAGE 1 OF 1

SPECIAL TEST REQUEST

TITLE F1 Special Engineering Test ORIGINATOR N. Constantinides
INSTRUMENT/MODEL F1 SMA MAJOR TEST PHASE _____
APPLICABLE DOC. TS 32015-004 APPROX. TEST TIME 2:30 pm
PURPOSE OF TEST: As per SBRC request run test flow Event H Sequence -7 for
Engineering Data Acquisition.

TEST CONFIGURATION: SMA on DTS Vacuum Chamber

TEST PROCEDURE: Run TFE-H, All four modes (Sequence 7). Use Sequence 7 for
Data Sheets 6.2.1.

Execute TFE-H as per TS 32015-004.

MODEL MANAGER *W.B. Brant* DATE: March 10, 1981
BTCE MANAGER N/A DATE: 3-9-81
SYST. ENG. MANAGER *W.B. Brant for Jack Engel* DATE: 3/9-81
PROD. ASSUR. MANAGER *J.P. Constantinides* DATE: 3-9-81

THEMATIC NO.
PF & FL OUT

(USE CONTINUATION SHEETS IF REQUIRED)

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Appendix B

Scan Mirror Assembly Acceptance Test Data

Part 1

Test Discrepancies

DATA SHEET 4.3.0-1: TEST DISCREPANCIES

Page 1 of 2

TEST NO. (FROM TABLE 6.2-1)	TEST FLOW EVENT	SEQUENCE NUMBER	DATE	PROBLEM	FRI	SPEC. OR REQUIREMENT	RESOLUTION, DATE, INITIALS
	A			WEIGHT SPEC ON DATA SHEET INCORRECT			UP TO DATE DATA SHT REQ.
K12, 12, 14	K-12	3	1-29-81	SME #2 MEAN ERROR ± RMS ERROR EXCEEDED SPEC ALONG SCAN	1325 1328	WAS 14.49 & 9.46 REQ. L1.75	TEST EQUIP PROT - SEE FR. 7/23/81 PAP
S12, 13, 14	S-12	3	1-29-81	SME #2 MEAN GRAS ERROR FOR REV EXCEEDED SPEC. ALONG SCAN	1328	WAS -1.71 & 1.82 REQ. L1.75	IMPROPER SHIMS REQ Retest 7/23/81 PAP
L20, 21, 22	L-20	3	1-30-81	SME #2 MEAN & RMS ERROR FOR REV EXC. SPEC. ALONG SCAN	1328	WAS -2.05 & 2.07 REQ. L1.75	IMPROPER SHIMS Retest 7/23/81 PAP
N13, 14, 15	N-13	3	2-2-81	SME #1 MEAN & RMS ERROR FOR REV EXC. SPEC. LONG SCAN	1328	WAS -2.65 REQ. L1.75	Retest 7/23/81 PAP
N13, 14, 15	N-13	3	2-2-81	SME1 CROSS SCAN REV-ENAS ERROR EXCEEDED SPEC.	1329	WAS -2.01 REQ. L1.5	Test Equip. Prot - See FR. 7/23/81 PAP
N20, 21, 22	N-20	3	2-2-81	SME2 ALONG SCAN MEAN ERROR REV. EXCEEDED SPEC.	1328	WAS -2.61 REQ. L1.75	as above
K-1 K-1	K-1 K-8	3 3	1-29-81	TURN AROUND TIME EXCEEDED SPEC.	1327	10590±68 MS SEC.	PROPER FRAME SHIMS REQ
S-1 S-8	S-1 S-8	3 3	1-29-81	" " "	1327	"	"
L-9 S-16	L-9 L-16	3 3	1-30-81 1-30-81	" " "	1327	"	"

NOTE: Throughout the testing of each SMA, this record shall be maintained (i.e. if various tests are repeated and/or rework is done, it will be clearly summarized on these sheets).

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Rev. 9

See FR.
Retest
7/23/81
PAP

DATA SHEET 4.3.0-1: TEST DISCREPANCIES

Page 1 of 2

TEST NO. (FROM TABLE 6.2-1)	TEST FLOW EVENT	SEQUENCE NUMBER	DATE	PROBLEM	FRB	SPEC. OR REQUIREMENT	RESOLUTION, DATE, INITIALS
	A			WEIGHT SPEC ON DATA SHEET INCORRECT			UP TO DATE DATA SHT REQ.
K12, 13, 14	K-12	3	1-29-81	SME #2 MEAN ERROR & RMS ERROR EXCEEDED SPEC. ALONG SCAN	1325 1329	WAS 14.49 & 9.46 REQ. < 1.75	TEST EQUIP PROTS - SEE FR. 3/23/81 MJC
S12, 13, 14	S-12	3	1-29-81	SME #2 MEAN & RMS ERROR FOR REV EXCEEDED SPEC. ALONG SCAN	1328	WAS -1.81 & 1.82 REQ. < 1.75	IMPROPER SHIMS 3/23/81 Retest 3/23/81 FR. MJC
L20, 21, 22	L-20	3	1-30-81	SME #2 MEAN & RMS ERROR FOR REV EXC. SPEC. ALONG SCAN	1328	WAS -2.05 & 2.07 Req. < 1.75	IMPROPER SHIMS Retest 3/23/81 MJC
N13, 14, 15	N-13	3	2-2-81	SME #1 MEAN & RMS ERROR FOR REV EXC. SPEC. LONG SCAN	1328	WAS -2.65 REQ. < 1.75	Retest 3/23/81 FR. MJC
N13, 14, 15	N-13	3	2-2-81	SME1 CROSS SCAN REV-CROSS ERROR EXCEEDED SPEC.	1329	WAS -2.01 REQ. < 1.5	Test Equip. Prob. - See FR. Retest 3/23/81 MJC
N20, 21, 22	N-20	3	2-2-81	SME2 ALONG SCAN MEAN ERROR REV. EXCEEDED SPEC.	1328	WAS -2.61 REQ. < 1.75	as above
K-1 K-1	K-1 K-8	3 3	1-29-81	TURN AROUND TIME EXCEEDED SPEC.	1327	10590168 MSGC.	PROPER FRAMES SHIMS REQ
S-1 S-8	S-1 S-8	3 3	1-29-81	" " "	1327	"	"
L-9 S-16	L-9 L-16	3 3	1-30-81 1-30-81	" " "	1327	"	"

NOTE: Throughout the testing of each SMA, this record shall be maintained (i.e. if various tests are repeated and/or rework is done, it will be clearly summarized on these sheets).

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Appendix B

Scan Mirror Assembly Acceptance Test Data

Part 2

Test Procedure Check Off Tables

3

TEST NO.	PAGE NO.	TITLE	VOLTS L, M, H	CONV. N, R	TEMP. 20, 24, 28	PSHE S, W	SHF 1, 2	DATA SH. NO.	DATA TAPE NAME	TRK NO.	FIRST FILE NO.	INIT	DATE	NOTES
A1	4.1.4	Test Equipment List						4.1.8-1				5	1/20/68	
A2	4.3.1	Mechanical Properties						4.3.1.1				28	1/3/81	
A3	4.3.6	Thermal Cycle						4.3.6.1						SEE TPE J

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ARE THESE REPEATED TESTS?

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TESTED BY RS DATE: 2/3/81 QA STAMP: _____

TABLE 6.2.1: CHECK OFF TABLE

SHA DESIGNATION: F-1 S/N 4 SEQUENCE NO. 6 TEST FLOW EVENT B

TEST NO.	PARA. NO.	TITLE	VOLTS L.M.H	CONFI. M.R	TEMP. 20, 24, 28	MODE S.D	SKE 1, 2	DATA SHIT. NO.	DATA TAPE NAME	TRK NO.	FIRST FILE NO.	INIT	DATE	NOTES
U1	4.3.2.1	Static Flatness						4.3.2-1				MW	1/13/81	
U2	4.3.2.1 (1)	Normal Position						4.3.2-2				MW	1/13/81	
U3	4.3.2.1 (2)	30° Position						4.3.2-2				MW	1/13/81	

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ARE THESE REPEATED TESTS?

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Received at New York
Date 11/28/60

SMA DESIGNATION F-1 S/N 4 SEQUENCE NO. 2 TEST FROM EVENT C

TEST NO.	PARA. NO.	TITLE	VOLTS L.M.H	CORREL. M.R	TEMP. 20, 24, 28	MODE S.B	SWG 1, 2	DATA SH. NO.	DATA TAPE RANGE	TRK NO.	FIRST FILE NO.	INIT	DATE	NOTES
C1	4.3.2.2	Dynamic Flatness						4.3.2.2				MW	7/13/64	
C2	4.3.2.2 (1)(a)	Static Midscan						4.3.2.3				MW	7/13/64	
	4.3.2.2 (1)(b)	Dynamic Midscan						4.3.2.3				MW	7/13/64	
	4.3.2.2 (1)(c)	Static Start						4.3.2.3				MW	7/13/64	
	4.3.2.2 (1)(d)	Dynamic Near-Start						4.3.2.3				MW	7/13/64	
	4.3.2.2 (2)	5 Fringe Static, Dynamic						4.3.2.4				MW	7/13/64	

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ARE THESE REPEATED TESTS?

CONCRETE • Fill in remainder of Test 01 - Data Sheet 4.3.2-1

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IN, TAM.

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TABLE 6.2.1: CHECK OFF TABLE

SMA DESIGNATION F-1 S/R 4 SEQUENCE NO. 1 TEST FLOW EVENT 1 OF 1 SHIFT

TEST NO.	PARA. NO.	TITLE	VOLTS L.N.H	COMEN. N.R	TEMP. 20, 24, 28	PHONE S.D	SAGE 1, 2	DATA SHIT. NO.	DATA TAPE NAME	TRK ID.	FIRST FILE NO.	INIT	DATE	NOTES
01	4.3.3.1	Scan Mirror Pointing						4.3.3-1				M	1/3/81	
02	4.3.3.2	Static SAM Angles						4.3.3-2				M	1/3/81	
	4.3.3.3	Linearity Ref. angles						4.3.3-3				M	1/3/81	
E1	4.3.7.1 4.3.7.4 4.3.7.6	Turnspeed/ Turn-on loading	L.H	N	24	S.D	1, 2	4.3.7-3				B	1/19/81	
E2	4.3.7.7	Data Photos	L.H.H	N	24	S	1	4.3.7-4				B	1/19/81	
E3	4.3.7.7	Data Photos	L.H.H	N	24	S	2	4.3.7-4				B	1/19/81	
E4	4.3.7.7	Data Photos	N	N	24	S	1	4.3.7-5				B	1/19/81	
E5	4.3.7.7	Data Photos	N	N	24	S	2	4.3.7-5				B	1/19/81	
E6	4.3.7.7	Data Photos	N	N	24	B	1	4.3.7-6				B	1/19/81	
E7	4.3.7.7	Data Photos	N	N	24	B	2	4.3.7-6				B	1/19/81	
E8	4.3.7.7	Turn-on data	N	N	24	B	1	4.3.7-7				B	1/19/81	
E9	4.3.7.7	Turn-on data	N	N	24	B	2	4.3.7-7				B	1/19/81	

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ARE THESE REPEATED TESTS? _____ REASON _____

COMMENTS _____

TESTED BY: P _____

DATE: _____ NA STAMP _____

TABLE 6.2.1: CHECK OFF TABLE

TEST NO.	PADA. NO.	TITLE	VOLTS L.M.H.	CORR. M.R.	TEMP. 20-24. 20	MODE S.B.	SWT 1,2	DATA SHIT. NO.	DATA TAPE MAG.	TRK NO.	FIRST FILE NO.	INIT DATE	NOTES
	4.3.7	Operability Check											
11	4.3.7.1	Automatic Check	0	0	24	S	1	4.3.7-1					Follow (1)
12	4.3.7.2	Manual Check	0	0	24	S	1	4.3.7-2					1/24/51
	4.3.7.3	Bumper Mode											
13	4.3.7.1	Automatic Check	0	0	24	0	1	4.3.7-1					Follow (1)
14	4.3.7.2	Manual Check	0	0	24	0	1	4.3.7-2					1/24/51
	4.3.7.4	Redundant SFE											
15	4.3.7.1	Automatic Check	0	0	24	S	2	4.3.7-1					Follow (1)
16	4.3.7.2	Manual Check	0	0	24	S	2	4.3.7-2					1/24/51

(1) Retain printout for these cases. Place in data book following indicated data sheet. (save telemetry and temperatures)

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CRASHES

REASON

ARE THESE REPEATED TESTS?

SMA DESIGNATION F-1 S/N 4 SERIAL NO. 1 TEST FLOW EVENT 1
SHEET 6 OF 01

TEST NO.	PARA. NO.	TITLE	VOLTS L.H.H	CONV. H.R	TEMP. 20, 24, 28	MODE S.B	SWG 1, 2	DATA SH. NO.	DATA TAPE NAME	TRK NO.	FIRST FILE NO.
	4.3.7.3	Redundant Bumper									
F7	4.3.7.1	Antozatic Check	N	N	24	B	2	3.7-1			
F8	4.3.7.2	Manual Check	N	N	24	B	2	3.7-2			

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ARE THESE REPEATED TESTS?

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TESTED BY:

DATE: 12/25/01

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TABLE 6.2.1: CHECK OFF TABLE

SHA DESIGNATION F S/N 11 SEQUENCE NO. 1 TEST FLOW EVENT G SHFT 01 OF 01

TEST NO.	PARA. NO.	TITLE	VOLTS L.A.H.	CORIN. H.R.	TEMP. 20, 24, 28	MODE S.B	SHE 1, 2	DATA SHIT. NO.	DATA TAPE NAME	TRK HD.	FIRST FILE NO.	INIT	DATE	NOTES
	4.3.7	Operability Check												
G1	4.3.7.1	Automatic Check	N	R	24	S	1	4.3.7-1				B	1/20/81	
G2	4.3.7.2	Manual Check	N	R	24	S	1	4.3.7-2				B	1/20/81	
	4.3.7.3	Bumper Mode												
G3	4.3.7.1	Automatic Check	N	R	24	B	1	4.3.7-2				B	1/20/81	
G4	4.3.7.2	Manual Check	N	R	24	B	1	4.3.7-2				B	1/20/81	
	4.3.7.4	Redundant SHE												
G5	4.3.7.1	Automatic Check	N	R	24	S	2	4.3.7-1				B	1/20/81	
G6	4.3.7.2	Manual Check	N	R	24	S	2	4.3.7-2				B	1/20/81	

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Rev. 11

ARE THESE REPEATED TESTS?

REASON

COMMENTS

TESTED BY

1/20/81

DATE

1/20/81

TIME

TABLE 6.2.1: CHECK OFF TABLE

SMA DESIGNATION 1-1 S/N 4 SEQUENCE NO. 6 TEST FLOW EVENT II
 SHIFT 9 OF 28

TEST NO.	PARA. NO.	TITLE	VOLTS L.N.H	CONH. H.R	TEMP. 20, 24, 28	MODE S, B	SAVE 1, 2	DATA SH. NO.	DATA TAPE NAME	TRK NO.	FIRST FILE NO.	INIT	DATE	NOTES
111	4.3.4	Scan Profile*	Remove Enter	SAW & Information	Torque Information	wear connector to connector								
112	4.3.4.1	SAW Scan Data	N	N	24	S	1		F1V6 (H)		1		2/2/81	K = READ 103
113	4.3.4.2	Bumper Scan Data	N	N	24	B	1		D6 (R)		5		2/2/81	(2) 103 105
114	4.3.4.2	Along Scan Profile	N	N	24	S	1		D6 (H)		5		3/2/81	K = READ 103
115	4.3.4.2	Along Scan Profile	N	N	24	S	1		D6 (R)		5		3/2/81	(2) 103 105
116	4.3.4.3	Band to Band Registration	N	N	24	S	1						3/2/81	
117	4.3.4.4	Gross Scan Profile	N	N	24	S	1						3/2/81	ORIGINAL OF POOR
118	4.3.4.4	Gross Scan Profile	N	N	24	S	1						3/2/81	PAGE IS QUALITY
119	4.3.4.4	Bumper Mode	N	N	24	S	1						3/2/81	
119	4.3.4.2	Along Scan Profile	N	N	24	B	1						3/2/81	
110	4.3.4.2	Along Scan Profile	N	N	24	B	1						3/2/81	
111	4.3.4.3	Band to Band Registration	N	N	24	B	1						3/2/81	

(2) Save calibration printout, insert in data book following previous data sheet.

ARE THESE REPEATED TESTS? YES REASON wrong scan angles previous

COMMENTS *Every time a new set of (4) Scan Profiles are run, sequence number is increased by (1)

TESTED BY JS DATE 3/2/81 QA STAMP

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TABLE 6.2.1: CHECK OFF TABLE

SMA DESIGNATION 1C-1 S/N 4 SEQUENCE NO. 6 TEST FLOW EVENT II
 SUFF 10 OF 20

TEST NO.	PARA. NO.	TITLE	VOLTS L.N.H	COMM. M.R	TEMP. 20, 24, 28	FOIDE S.B	SHE 1,2	DATA SHIT. NO.	DATA TAPE NAME	TRK NO.	FIRST FILE NO.	INIT	DATE	NOTES
1112	4.3.4.4	Cross Scan Profile	N	N	24	B	1	4.3.4-4						
1113	4.3.4.4	Cross Scan Profile	N	N	24	B	1	4.3.4-5						
	4.3.4	Redundant Scan Profiles												
1114	4.3.4.1	SAW Scan Data	N	N	24	S	2		1106 (N) 1106 (R)	0	9		2/27/81	K = 800 (2) 900/91
1115	4.3.4.1	Bumper Scan Data	N	N	24	B	2		1106 (N) 1106 (R)	0	13		2/27/81	K = 800 (2) 900/91
1116	4.3.4.2	Along Scan Profile	N	N	24	S	2	4.3.4-1					3/2/81	Boo K's report
1117	4.3.4.2	Along Scan Profile	N	N	24	S	2	4.3.4-2					3/2/81	twice
1118	4.3.4.3	Band to Band Registration	N	N	24	S	2	4.3.4-3					3/2/81	
1119	4.3.4.4	Cross Scan Profile	N	N	24	S	2	4.3.4-4					3/1/81	
1120	4.3.4.4	Cross Scan Profile	N	N	24	S	2	4.3.4-5					3/2/81	

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TS 32015-204

ARE THESE REPEATED TESTS? YES REASON wrong angles previous

COMMENTS

TH BY R DATE 1/1/81 OF STAMP

TABLE 6.2.1: CHECK OFF TABLE

SHA DESIGNATION		S/N		SEQUENCE NO.		TEST FLOW EVENT		SHEET		OF		TH		
F-1		4		6				11		01		20		
TEST NO.	PARA. NO.	TITLE	VOLTS L.N.U	CONV. N.R	TEMP. 20, 24, 20	PSHIE S.B	SMF 1, 2	DATA SHIT. NO.	DATA TAPE NAME	TRK NO.	FIRST FILE NO.	INIT	DATE	NOTES
1121	4.3.4.1	Bumper Pulse												
1122	4.3.4.2	Along Scan Profile	N	N	24	B	2	4.3.4-1					3/2/81	
1123	4.3.4.3	Along Scan Profile	N	N	24	B	2	4.3.4-2					3/2/81	
1124	4.3.4.4	Band to Band Registration	N	N	24	B	2	4.3.4-3					3/2/81	
1125	4.3.4.5	Cross Scan Profile	N	N	24	B	2	4.3.4-4					3/2/81	
1126	4.3.4.6	Cross Scan Profile	N	N	24	B	2	4.3.4-5					3/2/81	
J1	4.3.6.1	Workmanship Vibration						4.3.6-1						ORIGINAL PAGE IS OF POOR QUALITY
J2	4.3.6.2	Thermal Cycle												

ARE THESE REPEATED TESTS? YES REASON wrong SAM angles previous

COMMENTS

TESTED BY: ⓅDATE: 3/2/81 QA STAMP

TABLE 6.2.1: CHECK OFF TABLE

SMA DESIGNATION F-7 S/N 4 SEQUENCE NO. 6 TEST FLOW EVENT K
 SUFFY 12 OF 28

TEST NO.	PARA. NO.	TITLE	VOLTS L.N.H	COIN. N.R	TEMP. 20, 24, 28	MODE S.B	SMF 1, 2	DATA SHT. (in.)	DATA TAPE NAME	TRK NO.	FIRST FILE NO.	INIT	DATE	NOTES
	4.3.5	Operational Performance												
K1	4.3.5.1	Scan Parameters	II	N	24	S	1	4.3.5-	FID6 (N) D6 (K)	0	20	⊗	3/3/81	ORIGINAL OF POOR QUALITY
K2	4.3.5.1	Scan Parameters	II	N	24	S	1	4.3.5-				⊗	3/4/81	
K3	4.3.5.1	Scan Parameters	II	N	24	B	1	4.3.5-	D (N) D6 (R)	0	22	⊗	3/3/81	PAGE 18 OF POOR QUALITY
K4	4.3.5.1	Scan Parameters	II	N	24	B	1	4.3.5-				⊗	3/4/81	
K5	4.3.5.2	Geometric Repeatability	II	N	24	S	1		D6 (N) D6 (R)	0	1	⊗	3/3/81	K = + 0.00010 (compare with TFI 112) 94
K6	4.3.5.3	Along Scan (I.I.) Repeatability	II	N	24	S	1	4.3.5-				⊗	3/4/81	
K7	4.3.5.3	Cross Scan (I.I.) Repeatability	II	N	24	S	1	4.3.5-				⊗	3/4/81	

32015-024

ARE THESE REPEATED TESTS? YES REASON wrong scan angles previous

COMMENTS

TH BY AS DATE 04/23/01 ON STAMP

TABLE 6.2.1: CHECK OFF TABLE

SHA DESIGNATION F-1 S/N 4 SEQUENCE NO. 6 TEST FLOW EVENT K
 SHIFT 13 OF 28

TEST NO.	PARA. NO.	TITLE	VOLTS L.H.M	CONV. N.R	TEMP. 20, 24, 28	MODE S, B	SHE 1.2	DATA SHT. NO.	DATA TAPE NAME	TRK NO.	FIRST FILE NO.	INIT	DATE	NOTES
	4.3.5	Operational Performance												
K8	4.3.5.1	Scan Parameters	II	N	24	S	2	4.3.5-1	FD6 (N) D6 (R)	0 0	24 24	B	3/3/61	
K9	4.3.5.1	Scan Parameters	II	N	24	S	2	4.3.5-2				B	3/4/61	
K10	4.3.5.1	Scan Parameters	II	N	24	B	2	4.3.5-1	D6 (N) D6 (R)	8 0	26 26	B	3/3/61	
K11	4.3.5.1	Scan Parameters	II	N	24	B	2	4.3.5-2				B	3/4/61	
K12	4.3.5.2	Geometric Repeatability	II	N	24	S	2		D6 (N) D6 (R)	1 1	4 4	B	3/3/61	K = + 0.00010(86) See III4
K13	4.3.5.3	Along Scan (L.L) Repeatability	II	N	24	S	2	4.3.5-3				B	3/4/61	
K14	4.3.5.3	Cross Scan (L.L) Repeatability	II	N	24	S	2	4.3.5-4				B	3/4/61	

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REV. 2

REASON wrong samples previousARE THESE REPEATED TESTS? YES

COMMENTS

TESTED BY

DATE 3/2/61 NA STAMP

03

TABLE 6.2.1: CHECK OFF TABLE

SMA DESIGNATION F-1 S/N 41 SEQUENCE NO. 6 TEST FLOW EVENT S
SHIFT 15 OF 20

TEST NO.	PARA. NO.	TITLE	VOLTS L.N.H	CONV. H.R	TEMP. 20, 24, 28	MODE S.B	SWF 1, 2	DATA SHIT. NO.	DATA TAPE NAME	TRK NO.	FIRST FILE REL.	INIT	DATE	NOTES
	4.3.5	Operational Performance												
S1	4.3.5.1	Scan Parameters	L	H	24	S	2	4.3.5-1	D6 (N)	1	7	⊗	3/4/81	
S2	4.3.5.1	Scan Parameters	L	N	24	S	2	4.3.5-2	D6 (R)	1	7	⊗	3/4/81	
S3	4.3.5.1.1	Scan Parameters	L	N	24	B	2	4.3.5-1	D6 (N)	1	9	⊗	3/4/81	
S4	4.3.5.1.1	Scan Parameters	L	N	24	D	2	4.3.5-2	D6 (R)	1	9	⊗	3/4/81	
S5														
S5	4.3.5.2	Geometric Repeatability	L	N	24	S	2		D7 (N)	0	1	⊗	3/4/81	K = 85 + 0.00010 ()
S6	4.3.5.3.1	Along Scan (11) Repeatability	L	N	24	S	2	4.3.5-3	D7 (R)	0	1	⊗	3/5/81	See III4
S7	4.3.5.3.2	Cross Scan (11) Repeatability	L	N	24	S	2	4.3.5-2				⊗	3/5/81	

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ARE THESE REPEATED TESTS? YES REASON WRONG SAM ANGES previous

COMMENTS

TESTED BY. ⊗DATE 3/3/81PAGE 7

TABLE 6.2.1: CHECK OUT TABLE

SMA DESIGNATION F-1 S/N 4 SEQUENCE NO. 6 TEST FLOW EVENT 5
 SHEET 14 OF 20

TEST NO.	PARA. NO.	TITLE	VOLTS L, R, H	CONN. H, R	TEMP. 20, 24, 28	MODE S, R	SHF 1, 2	DATA SUT. NO.	DATA NAME	TRK NO.	FIRST FILE NO.	INIT.	DATE	NOTES
	4.3.5	Operational Performance												
S8	4.3.5.1	Scan Parameters	1	N	24	S	1	1.3.5-1	D6 (H)	1	11	8	3/4/81	
S9	4.3.5.1	Scan Parameters	1	N	24	S	1	1.3.5-2	D6 (H)		11	8	3/4/81	
S10	4.3.5.1	Scan Parameters	1	N	24	R	1	1.3.5-1	D6 (H)	1	13	8	3/4/81	
S11	4.3.5.1	Scan Parameters	1	N	24	R	1	1.3.5-2	D6 (H)		13	8	3/5/81	
S12	4.3.5.2	Geometric Repeatability	1	N	24	S	1		D7 (N)	0	4	8	3/1/81	K = + 0.00010(See #?)
S13	4.3.5.3	Along Scan (L, R) Repeatability	1	N	24	S	1	1.3.5-3	D7 (R)	0	4	8	3/5/81	
S14	4.3.5.3	Cross Scan (L, R) Repeatability	1	N	24	S	1	1.3.5-4				8	3/5/81	

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TS 32015-001
K2.0

ARE THESE REPEATED TESTS? YES REASON wrong samples previous

COMMENTS

TESTED BY: BDATE: 3/3/81 QA STAMP:

TABLE 6.2.1: CHECK OFF TABLE

SMA DESIGNATION F-1 S/R 4 SEQUENCE NO. 6 TEST FLOW EVENT L
 SHIFT 16 OF 24

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TS 32015-001

TEST NO.	PARA. NO.	TITLE	VOLTS L,N,H	CONN. N,R	TEMP. 20,24, 20	MODE S,B	SME 1,2	DATA SHT. NO.	DATA TAPE NAME	TRK NO.	FIRST FILE NO.	INIT	DATE	NOTES
	4.3.7	Operability Check												
11	4.3.7.1	Automatic Check	I	N	20	S	1	4.3.7-1					3/5/81	
12	4.3.7.2	Manual Check	L	N	20	S	1	4.3.7-2					3/5/81	
	4.3.7.3	Bumper Mode												
13	4.3.7.1	Automatic Check	L	N	20	B	1	4.3.7-1					3/5/81	
14	4.3.7.2	Manual Check	L	N	20	B	1	4.3.7-2					3/5/81	
	4.3.7.4	Redundant SME												
15	4.3.7.1	Automatic Check	L	N	20	S	2	4.3.7-1					3/5/81	
16	4.3.7.2	Manual Check	L	N	20	S	2	4.3.7-2					3/5/81	

ARE THESE REPEATED TESTS? YES REASON wrong Sam Angles previous

COMMENTS

TESTED BY JB DATE 3/21/81 ON 51MP

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SHA DESIGNATION:

W

TABLE 6.2.1: CHECK OFF TABLE

SHA DESIGNATION C-1 S/N 4 SEQUENCE NO. 6 TEST FLOW EVENT 1SHEET 18 OF 28

TEST NO.	PARA. NO.	TITLE	VOLTS L,H,M	CORR. N,R	TEMP. 20, 24, 28	MODE S,B	SHF 1,2	DATA SHF. NO.	DATA TAPE NAME	TRK NO.	FIRST FILE NO.	INIT	DATE	NOTES
	4.3.5	Operational Performance												
19	4.3.5.1	Scan Parameters	L	N	20	S	1	4.3.5-1	07 (H) 07 (R)	0	7	0	3/5/81	
110	4.3.5.1	Scan Parameters	L	N	20	S	1	4.3.5-2				0	3/6/81	
111	4.3.5.1	Scan Parameters	L	N	20	B	1	4.3.5-1	07 (H) 07 (R)	0	9	0	3/5/81	
112	4.3.5.1	Scan Parameters	L	N	20	B	1	4.3.5-2				0	3/6/81	
113	4.3.5.2	Geometric Repeatability	L	N	20	S	1		07 (H) 07 (R)	1	1	0	3/5/81	K = 0.0000107 ()
114	4.3.5.3	Along Scan (L,H) Repeatability	L	N	20	S	1	4.3.5-3				0	3/6/81	QO (compare with IFE-II2)
115	4.3.5.3	Cross Scan (L,H) Repeatability	L	N	20	S	1	4.3.5-4				0	3/6/81	

ARE THESE REPEATED TESTS? YES

REASON

WRONG SAN ANGLES PREVIOUS

COMMENTS

TESTED BY BSDATE 4/3/81ON ...ORIGINAL PAGE IS
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TABLE 6.2.1: CHECK OFF TABLE

SMA DESIGNATION F-1 S/N 4 SEQUENCE NO. 6 TEST FLOW EVENT 1
 SIFT 19 OF 28

TEST NO.	PARA. NO.	TITLE	VOLTS L, M, H	CONV. M, R	TEMP. 20, 24, 28	MODE S, B	SHE 1, 2	DATA SHT. NO.	DATA TAPE NAME	TAK NO.	FIRST FILE NO.	INIT	DATE	NOTES
	4.3.5	Operational Performance												
116	4.3.5.1	Scan Parameters	L	M	20	S	2	4.3.5-1	07 (M) 07 (R)	0 0	11 11	B	3/5/81	
117	4.3.5.1	Scan Parameters	L	M	20	S	2	4.3.5-2				B	3/6/81	
118	4.3.5.1	Scan Parameters	L	M	20	B	2	4.3.5-1	07 (M) 07 (R)	0 0	13 13	B	3/5/81	
119	4.3.5.1	Scan Parameters	L	M	20	B	2	4.3.5-2				B	3/6/81	
120	4.3.5.2	Geometric Repeatability	L	M	20	S	2		07 (M) 07 (R)	1 1	4 4	B	3/5/81	K = 8.2 ± 0.0000107(1) See III4
121	4.3.5.3	Along Scan (L.L) Repeatability	L	M	20	S	2	4.3.5-3				B	3/6/81	
122	4.3.5.3	Cross Scan (L.L) Repeatability	L	M	20	S	2	4.3.5-4				B	3/6/81	

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ARE THESE REPEATED TESTS? YES REASON wrong scan angles previous

COMMENTS

TESTED BY

QA STAMP

DATE

3/5/81

TABLE 6.2.1: CHECK OFF TABLE

SHA DESIGNATION	F-1	S/R	4	SEQUENCE NO.	6	TEST FLOW EVENT	N
							SHIFT 20 OF 28

TEST NO.	PARA. NO.	TITLE	VOLTS L.N.H	CONCH. M.R	TEMP. 20.24, 28	PERCE S.B	SME 1,2	DATA SHI. NO.	DATA TAPE NAME	TRK NO.	FIRST FILE NO.	INIT	DATE	NOTES
	4.3.7	Operability Check												
N1	4.3.7.1	Automatic Check	H	N	28	S	1	4.3.7-1				B	3/6/61	
N2	4.3.7.2	Manual Check	H	N	28	S	1	4.3.7-2				B	3/6/61	
	4.3.7.3	Disarmer Mode												
N3	4.3.7.1	Automatic Check	H	N	28	B	1	4.3.7-1				B	3/6/61	
N4	4.3.7.2	Manual Check	H	N	28	B	1	4.3.7-2				B	3/6/61	
	4.3.7.4	Redundant SME												
N5	4.3.7.1	Automatic Check	H	N	28	S	2	4.3.7-1				B	3/6/61	
N6	4.3.7.2	Manual Check	H	N	28	S	2	4.3.7-2				B	3/6/61	

ARE THESE REPEATED TESTS? YES REASON wrong sample periods

COMMENTS

All over 511

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TABLE 6.2.1: CHECK OFF TABLE

SMA DESIGNATION F-1 S/N 41 SEQUENCE NO. 6 TEST FLOW EVENT 4

SHEET 21 OF 28

TEST NO.	PARA. NO.	TITLE	VOLTS L.M.M	CONV. M.R	TEMP. 20, 24, 28	MODE S.B	SHE 1, 2	DATA SHT. NO.	DATA TAPE NAME	TRK NO.	FIRST FILE NO.	INIT	DATE	NOTES
	4.3.7.3	Redundant Bumper												
47	4.3.7.1	Automatic Check	11	N	28	D	2	1.3.7-1					3/6/81	
48	4.3.7.2	Manual Check	11	N	28	D	2	1.3.7-2					3/6/81	

ARE THESE REPEATED TESTS? YES REASON wrong sam angles provides

COMMENTS

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DATE 3/6/51 NA STAMP

TABLE 6.2.1: CHECK OFF TABLE

SMA DESIGNATION F-1 S/N 4 SEQUENCE NO. 6 TEST FLOW EVENT N SHIFT 22 OF 28

TEST NO.	PARA. NO.	TITLE	VOLTS L.M.H	COMM. H.R	TEMP. 20, 24, 28	MODE S.D	SME 1,2	DATA SH. NO.	DATA TAPE NAME	TRK NO.	FIRST FILE NO.	INIT	DATE	NOTES
	4.3.5	Operational Performance												
N9	4.3.5.1	Scan Parameters	H	N	28	5	1	4.3.5-1	D7 (H)	1	1		3/10/81	
N10	4.3.5.1	Scan Parameters	H	N	28	S	1	4.3.5-2	D7 (R)				3/10/81	
N11	4.3.5.1	Scan Parameters	H	N	28	B	1	4.3.5-1	D7 (N)	1	90		3/10/81	
N12	4.3.5.1	Scan Parameters	H	N	28	B	1	4.3.5-2	D7 (R)	1	90		3/10/81	
N13	4.3.5.2	Geometric Repeatability	H	N	28	S	1		D7 (N)	0	1		3/10/81	K = 89 + 0.0000107() (See H2)
N14	4.3.5.3	Along Scan(L.L) Repeatability	H	N	28	S	1	4.3.5-3	D7 (R)				3/10/81	
N15	4.3.5.3	Cross Scan(L.L) Repeatability	H	N	28	S	1	4.3.5-4					3/10/81	

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Rev. (3)

ARE THESE REPEATED TESTS? ✓ REASON along scan angles provided

COMMENTS

TFS: IV

DATE

NA

TABLE 6.2.1: CHECK OFF TABLE

SMA DESIGNATION F-1 S/R 4 SEQUENCE NO. 6 TEST FLOW EVENT N
 SHEET 23 OF 28

TEST NO.	PARA. NO.	TITLE	VOLTS L.N.H	CONV. N.R	TEMP. 20, 24, 28	MODE S.B	SWR 1.2	DATA SUT. NO.	DATA TAPE NAME	TRK NO.	FIRST FILE NO.	INIT	DATE	NOTES
	4.3.5	Operational Performance												
N16	4.3.5.1	Scan Parameters	II	N	28	S	2	4.3.5-1	D1 (N) D1 (R)	1 1	11 11	⊗	3/6/81	
N17	4.3.5.1	Scan Parameters	II	N	28	S	2	4.3.5-2				⊗	3/9/81	
N18	4.3.5.1	Scan Parameters	II	N	28	B	2	4.3.5-1	D7 (N) D7 (R)	1 1	13 13	⊗	3/6/81	
N19	4.3.5.1	Scan Parameters	II	N	28	B	2	4.3.5-2				⊗	3/9/81	
N20	4.3.5.2	Geometric Repeatability	II	N	28	S	2		D8 (N) D8 (R)	1 1	4 1	⊗	3/6/81	K = 75 ± 0.0000107 () (See 1114)
N21	4.3.5.3	Along Scan (L.I) Repeatability	II	N	28	S	2	4.3.5-3				⊗	3/9/81	
N22	4.3.5.4	Cross Scan (L.I) Repeatability	II	N	28	S	2	4.3.5-4				⊗	3/6/81	

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REASON wrong scan angles previousyes

ARE THESE REPEATED TESTS?

COMMENTS

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TABLE 6.2.1: CHECK OFF TABLE

SMA DESIGNATION F-1 S/N 4 SEQUENCE NO. 6 TEST FLOW EVENT R
 SHFT 24 OF 28

TEST NO.	PARA. NO.	TITLE	VOLTS L.N.H	CONN. N.R	TEMP. 20, 24, 28	MODE S,B	SME 1,2	DATA SHIT. NO.	DATA TAPE NAME	TRK NO.	FIRST FILE NO.	INIT	DATE	NOTES
	4.3.7	Operability Check												
R1	4.3.7.1	Automatic Check	N	N	24	S	1	4.3.7-1					3/9/81	
R2	4.3.7.2	Manual Check	N	N	24	S	1	4.3.7-2					3/9/81	
	4.3.7.3	Bumper Mode												
R3	4.3.7.4	Automatic Check	N	N	24	B	1	4.3.7-1					3/9/81	
R4	4.3.7.5	Manual Check	N	N	24	B	1	4.3.7-2					3/9/81	
	4.3.7.6	Redundant SME												
R5	4.3.7.7	Automatic Check	N	N	24	S	2	4.3.7-1					3/9/81	
R6	4.3.7.8	Manual Check	N	N	24	S	2	4.3.7-2					3/9/81	

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REASON

ARE THESE REPEATED TESTS?

COMMENTS

TESTING

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ON 3/9/81

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REASON

ARE THESE REPEATED TESTS?

ANALYSIS

DATE 2/2/51

TABLE 6.2.1: CHECK OFF TABLE

SHA DESIGNATION F-1 S/N 4 SEQUENCE NO. 6 FIRST FLOW EVENT R
 SHIFT 26 OF 28

TEST NO.	PARA. NO.	TITLE	VOLTS L.N.H	CONN. N.R	TEMP. 20, 24, 28	MODE S.B	SME 1,2	DATA SHIT. NO.	DATA TAPE NAME	TRK NO.	FIRST FILE NO.	INIT	DATE	NOTES
	4.3.5	Operational Performance												
R9	4.3.5.1	Scan Parameters	N	N	24	S	1	4.3.5-1	D8 (N)				3/9/81	
R10	4.3.5.1	Scan Parameters	N	N	24	S	1	4.3.5-2	D8 (R)				3/10/81	
R11	4.3.5.1	Scan Parameters	N	N	24	B	1	4.3.5-1	D8 (N)				3/9/81	
R12	4.3.5.1	Scan Parameters	N	N	24	B	1	4.3.5-2	D8 (R)				3/10/81	
R13	4.3.5.2	Geometric Repeatability	N	N	24	S	1		D8 (N)				3/9/81	K = 91 ± 0.000107 () (See 112)
R14	4.3.5.3	Along Scan (L.I.) Repeatability	N	N	24	S	1	4.3.5-3	D8 (R)				3/10/81	
R15	4.3.5.3	Cross Scan (L.I.) Repeatability	N	N	24	S	1	4.3.5-4					3/10/81	

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ARE THESE REPEATED TESTS? No REASON

COMMENTS

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DATE 4/9/81

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TABLE 6.2.1: CHECK OFF TABLE

SHA DESIGNATION F-1 S/N 4 SEQUENCE NO. 5 TEST FLOW EVENT R SHFT 27 OF 28

TEST NO.	PARA. NO.	TITLE	VOLTS L, N, H	CORRN. N, R	TEMP. 20, 24, 28	MODE S, B	SHF 1, 2	DATA SHF. NO.	DATA TAP NAME	TRK NO.	FIRST FILE NO.	INIT	DATE	NOTES
	4.3.5	Operational Performance												
H16	4.3.5.1	Scan Parameters	N	N	24	S	2	4.3.5-1	DK (N) DB (R)				3/9/81	
H17	4.3.5.1	Scan Parameters	N	N	24	S	2	4.3.5-2					3/10/81	
H18	4.3.5.1	Scan Parameters	N	N	24	B	2	4.3.5-1	DK (N) DB (R)				3/9/81	
H19	4.3.5.1	Scan Parameters	N	N	24	B	2	4.3.5-2					3/10/81	
R20	4.3.5.2	Geometric Repeatability	N	N	24	S	2		DK (N) DB (R)				3/4/81	K = 79 ± 0.0000107 () (See H114)
R21	4.3.5.3	Along Scan (L, I) Repeatability	N	N	24	S	2	4.3.5-3					3/10/81	
R22	4.3.5.4	Cross Scan (L, I) Repeatability	N	N	24	S	2	4.3.5-4					3/10/81	

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R.W.G.

REASON

ARE THESE REPEATED TESTS?

No

COMMENTS

TESTED BY

QA STAMP

DATE 3/9/81

TABLE 6.2.1: CHECK OFF TABLE

SMA DESIGNATION P-1 S/N 4 SEQUENCE NO. 6 TEST FLOW EVENT T-V
 SHIFT 20 OF 24

TEST NO.	PARA. NO.	TITLE	VOLTS L.H.U	CORR. R.R	TEMP. 20, 24, 28	MODE S,B	SME 1,2	DATA SHT. NO.	DATA TAPE NAME	TRK NO.	FIRST FILE NO.	INIT	DATE	NOTES
T1	4.3.2.2	Static Flatness						4.3.2-1					3/11/81	
T2	4.3.2.2 (1)	Normal Position						4.3.2-2					3/11/81	
	4.3.2.2 (2)	900 Position						4.3.2-2					3/11/81	
V1	5.0	Preparation for Delivery												
V2	5.1.1	Cleaning												
V3	5.3.2	SMA cover and rear connectors												
V4	5.1.2	Packaging Shock Indictors												NA Stamp
V5	5.2.1	Program Listings						5.2-1 (multiple)				B	3/16/81	
V6	5.2.2	Data Tape log						4.3.0-2 (multiple)				B	3/16/81	
V7	5.2.2	Data Summary						5.2-2 thru 5.2-9				B	3/16/81	

TS 32015-0

30

ARE THESE REPEATED TESTS? No REASON

COMMENTS

TEST Y B DATE 3/16/81 SMA STAMP

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Appendix B

Scan Mirror Assembly Acceptance Test Data

Part 3

Test Flow Event A

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Appendix B

Scan Mirror Assembly Acceptance Test Data

Part 4

Test Flow Event B

DATE SHEET 4.3.2-1
Scan Mirror Flatness

Static Flatness

Vertical axis

Vertical Axis

Indicate Fail if either Static
or Dynamic flatness failed.

Horizontal Axis $\leq 2\%$
Vertical Axis $\leq 2\%$ } STATIC

Spec	Value	Pass/ Fail
4.5μRAD		
	0.84μRAD	P
	0.86μRAD	P
4.5μRAD		
* {	0.84μRAD	P
{	0.86μRAD	P
(±5%)	—	P

Comments: No change from static performance observed

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Appendix B

Scan Mirror Assembly Acceptance Test Data

Part 5

Test Flow Event C

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35

TS 32015-004

green 8

161-2222

DATA SHEET 432-2
SCAN MIRROR STATIC FLATNESS

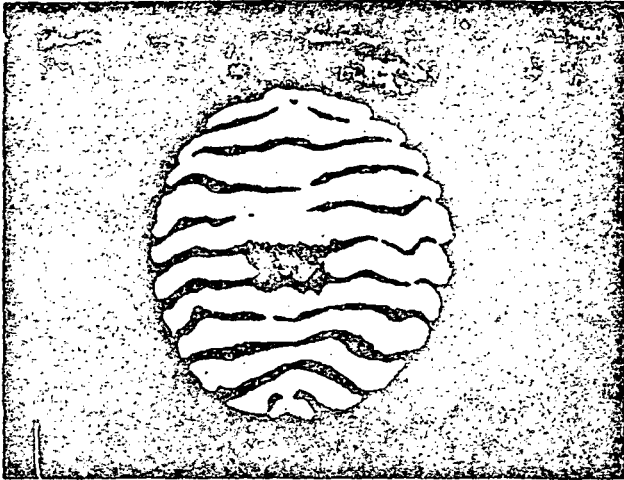
SMA Designation F1

S/N 004

Scan Mirror 005

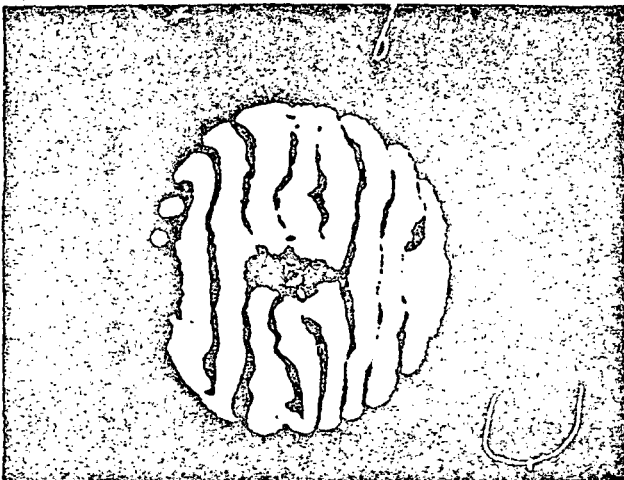
S/N 005

Scan Mirror Position: _____



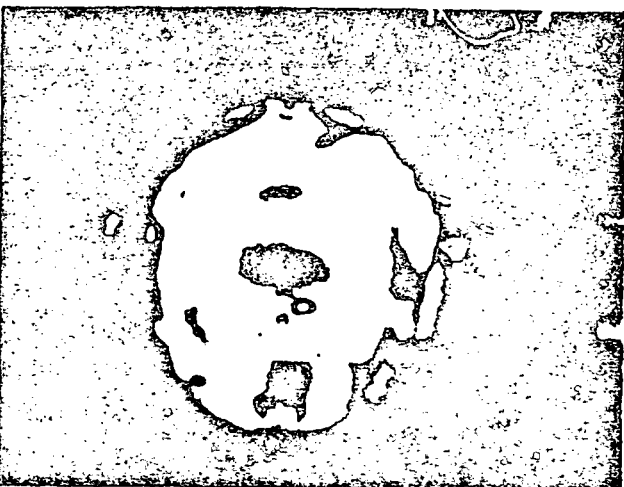
13 JAN 81 51RNG HRRG SINCCS

HORIZONTAL



13 JAN 81 9FRNG VERT SINCCS

VERTICAL



13 JAN 81 2ENC ORDER SINCCS

ZERO
ORDER



DA Stamp

Date: 13 Jan '81

Test Flow Event: _____

Comments: _____

Tested By: *M. P. Wick*

RECEIVED

ORIGINAL PAGE 13
OF POOR QUALITY

TS 32015-004

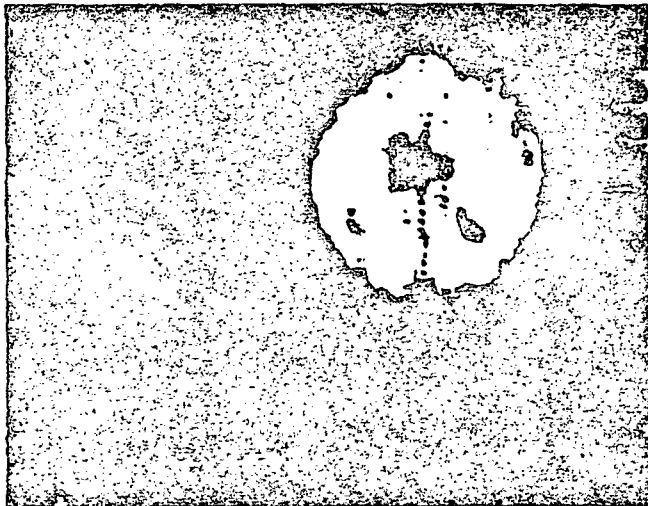
Rw. B

02 2200

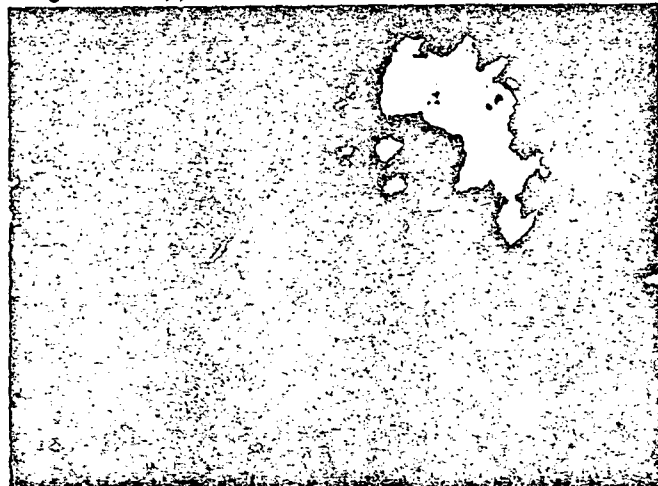
36



F-1 S/N 004 14 JAN 81 DYN FLAT
Ruling Vert. STATIC AT PI AT CC



F-1 S/N 004 14 JAN 81 DYN FLAT
Ruling HORIZ. STATIC AT PI AT CC



F-1 S/N 004 14 JAN 81 DYN FLAT

DATA SHEET 4.3.2-3
SCAN MIRROR DYNAMIC FLATNESS

SMA Designation F1

S/N 004

Scan Mirror F1

S/N 005

4.3.2.2 Step C.1 (✓) a ✓ b - c - d -

Ronchi Ruling Frequency 175

Static (✓) ✓

Dynamic (✓) ✓

Location: Start (PQ) ✓

RONCHI RULING
VERTICAL Midspan ✓
Other

RONCHI RULING
HORIZONTAL

RONCHI RULING
45 DEGREES



QA Stamp

Date 14 Jan 81

Test Flow Even:

Comments:

Tested By Mr. P. J. Vink

NO. 48015-004

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TS 32015-004

Rw. B

37

00-85203

DATA SHEET 4.2.3
SCAN MIRROR DYNAMIC FLATNESS

SMA Designation F1

S/N 004

Scan Mirror F1

S/N 005

4.2.2.2 Step C.1 (✓) a-b ✓ c-d

Renchi Ruling Frequency 17.5

Static (✓)

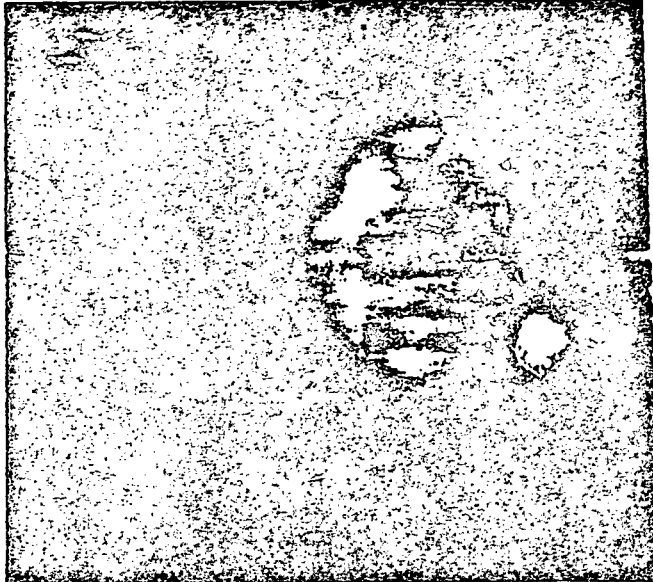
Dynamic (✓)

Location: Start (PO)

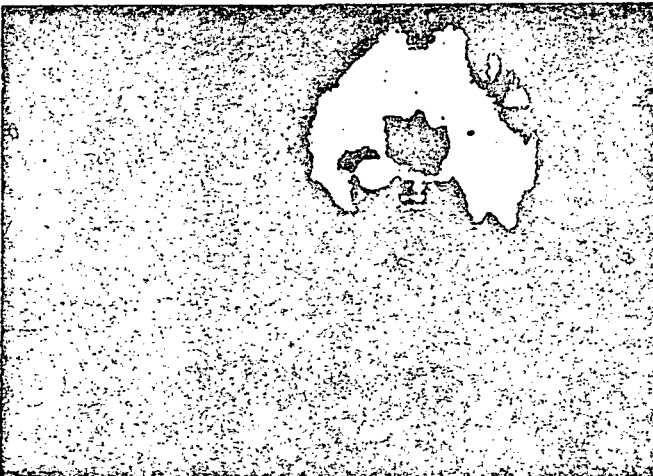
Midspan ✓

Other

RENCHI
RULING
VERTICAL



F-1 S/N 004 15 JAN 81 DYN FLAT
RULING VERT DYN AT PI AT CC



F-1 S/N 004 15 JAN 81 DYN FLAT
RULING HORIZ. DYN AT PI AT CC



F-1 S/N 004 15 JAN 81 DYN FLAT
RULING 45° DYN AT PI AT CC

RENCHI
RULING
HORIZONTAL

RENCHI
RULING
45 DEGREE



QA Stamp

Date 15 Jan 81

Test Flow Event

Comments

Tested By

M. P. [Signature]

NO. 4850 00

ORIGINAL PAGE 18
OF POOR QUALITY

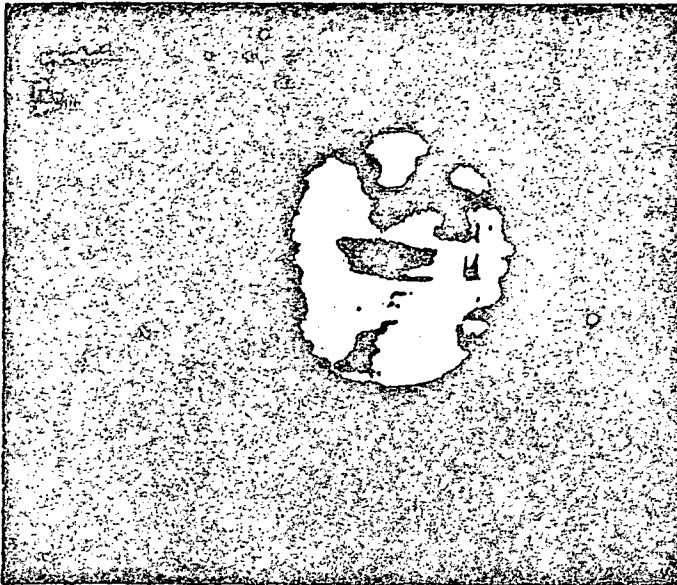
TS 32015-004

Rev. B

02-11200

DATA SHEET 4.12.3
SCAN MIRROR DYNAMIC FLATNESS

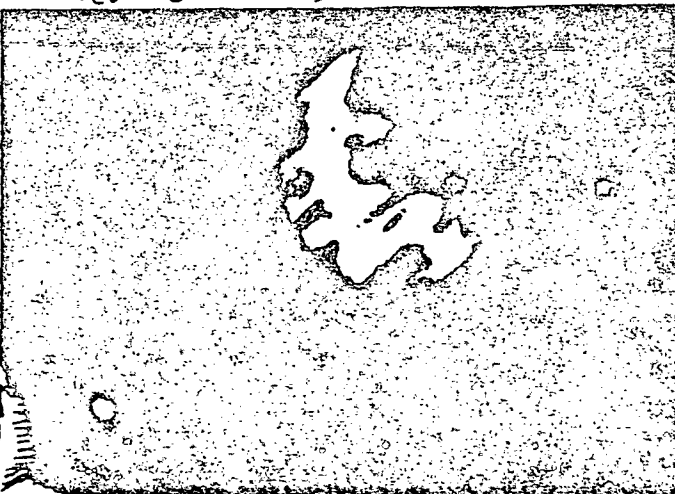
SMA Designation F1
SN 004
Scan Mirror F1
SN 005
4.12.3 Step C1 (✓) a-b-c-d-
Ronchi Ruling Frequency 175
Static (✓)
Dynamic (✓)
Location: Start (PO) ✓
Ronchi Ruling Midscan
VERTICAL Other



F1 SN 004 15 JAN 81 DYN FLAT
RULING VERT STATIC PO AT CC



F1 SN 004 15 JAN 81 DYN FLAT
RULING HORIZ STATIC PO AT CC



F1 SN 004 15 JAN 81 DYN FLAT

RONCHI
RULING
HORIZONTAL

RONCHI
RULING
45 DEGREE



QA Stamp

Date: 15 Jan 81

Tested By: *M. J. V. V. V.*

Test Flow Event:

Comments:

02-11200-0

TS 32015-004

Rev. 3

00320 30

DATA SHEET 4.2.2.3
SCAN MIRROR DYNAMIC FLATNESS

SMA Designation F1

S/N 004

Scan Mirror F1

S/N 005

4.2.2.3 Step C.1 (1/1) a b c d ☒

Ronchi Ruling Frequency 175

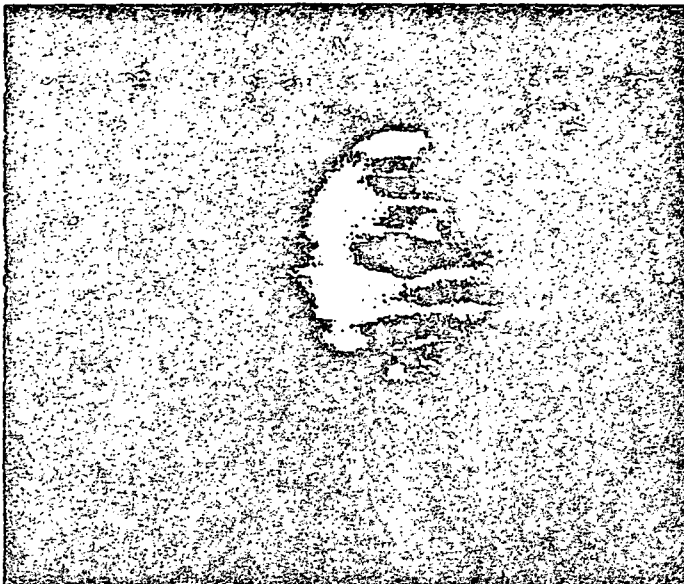
Static ☒

Dynamic ☒

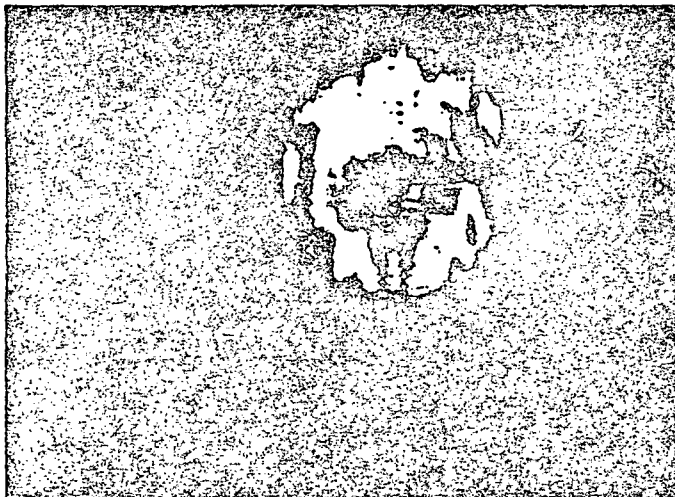
Location: Start (PO) ☒

RONCHI RULING
VERTICAL

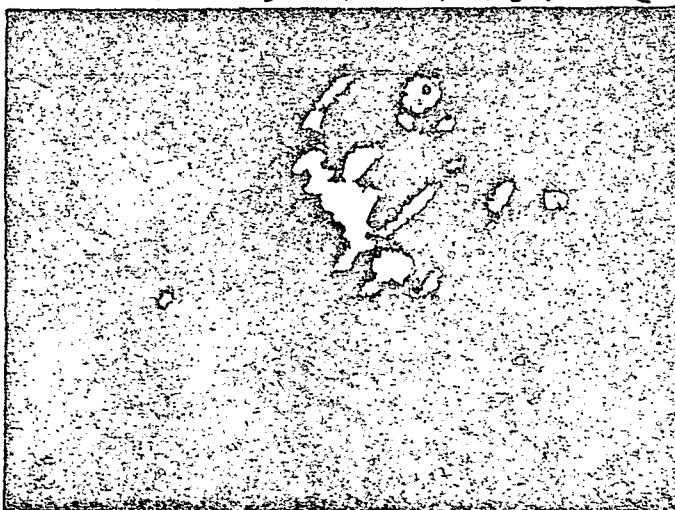
Midspan
Other



#1 SN 004 15 JAN 81 DYN FLAT
RULING 175 DYN AT PO AT CC



F1 SN 004 15 JAN 81 DYN FLAT
RULING 175 DYN AT PO AT CC



F1 SN 004 15 JAN 81 DYN FLAT
RULING 175 DYN AT PO AT CC

RONCHI
RULING
HORIZONTAL

RONCHI
RULING
45 DEGREES



15 Jan '81

QA Stamp

Date

Test Flow Event

Comments

Tested By Bill Ward

NO. 280-D-0

ORIGINAL PAGE 19
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TS 32015-004

Rev. 3

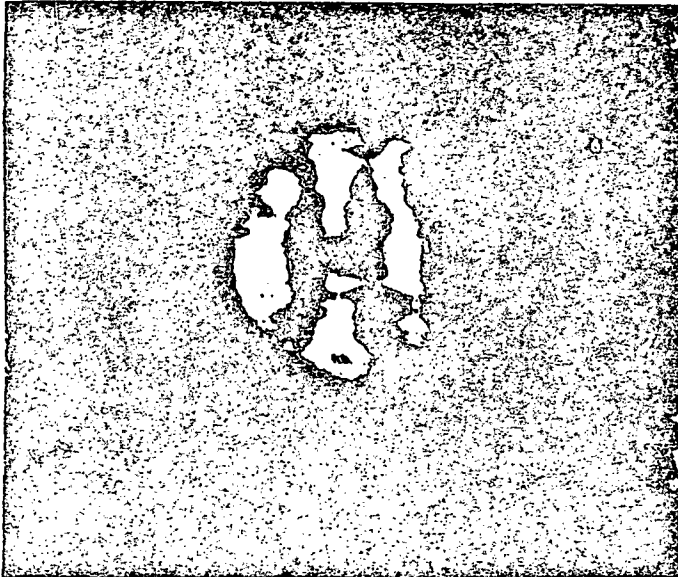
00228 31

4C

DATA SHEET 4.3.2.4
SCAN MIRROR STATIC FLATNESS

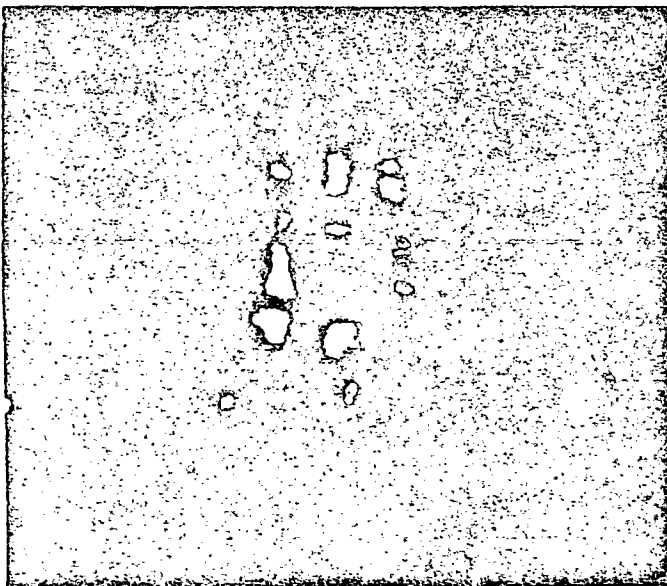
4.3.2.2 Steps C.2
B Fringe at Scan Center

F. SIN 004 14 JAN 81 DYN FLAT
RULING VENT STATIC AT 76 INSIDE CC



STATIC

F. SIN 004 15 JAN 81 DYN FLAT
RULING VENT DYN AT FC INSIDE CC



DYNAMIC



QA Stamp

Date 15 JAN 81

Test Flow Event C

Tested By *W. J. W. 10/10/81*

Comments: *Changes observed at ang position of the scan mirror on 10/10/81 making orientation.*

NO. REC'D - 1

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Appendix B

Scan Mirror Assembly Acceptance Test Data

Part 6

Test Flow Event D

ORIGINAL PAGE IS
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TS 32015-004

R223

DATA SHEET 4.3.3-1

Optical Measurements

SMA Alignment

SMA DESIGNATION F1 S/N 004
REFERENCE MIRROR


Measured Pointing Angles

	Along			Cross		
	Deg	Minute	Second	Deg	Minute	Second
Frame Reference	257	10	28	89	59	23 41 <i>up</i>
SAM (1) Mid	257	8	59.7	89	59	22
SAM (2) Mid	257	9	02	89	59	23

Relative Angles

	Along				Cross			
	Deg	Minute	Second	P/F	Deg	Minute	Second	P/F
REF mirror	0	00	00	X	0	00	00	X
SAM (1)	0	1	28.3	P	0	0	19	P
SAM (2)	0	1	26.0	P	0	0	18	P
SPEC	≤ 0	06	00	X	≤ 0	06	00	X

NOTE: Data Sheets representing pages 73 and 74 of this document are intentionally deleted.

Date 16 Jan '80 QA Stamp 
Test Flow Event D Tested by M. P. W. [Signature]

NO. REQ'D = 1

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TS 32015-004
15 June 1979

DATA SHEET 4.3.3-3
Optical Measurements

SMA Designation F1 S/N 004
Static SAM Angles (continued)

(d) Linearity Reference Angles*

	B	POP1	P2P3	A	
SAM (1)	-3°55'45"	-3°50'52.6"	3°50'55"	3°55'44"	deg,min,sec
	0.068577	0.0671592	0.0671709	0.0685720	radians
SAM (2)	-3°55'21"	-3°50'52.7"	3°50'57.3"	3°55'49"	deg,min,sec
	0.0684605	0.0671597	0.0671820	0.0685763	radians
CAL SAM	/ DOES NOT APPLY /			/ /	deg,min,sec
					radians

*with respect to midscan

② changes FEB-16-81 BY SEPARATE
THEODOLITE MEASUREMENT

(e) Active Scan Amplitude (P2P3-POP1)

SAM	P2P3-POP1	Spec*	Pass	Fail
(1)	7°41'47.8"	7°37'47"	✓	
(2)	7°41'50.0"	to 7°45'37"	✓	

*Spec narrowed 1 IFOV each end to allow for SAM offsets.

(f) Midscan Lock Position

SAM	P2P3+POP1	Spec	Pass	Fail
(1)	+2.4"	-30" to +30"	✓	
(2)	+4.6"	-30" to +30"	✓	

Date 1-20-80 QA Stamp



Test Flow Event D Tested by M.P. Wink

Comments 7.4TH FROM D21

NO. REQ'D = 1

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Appendix B

Scan Mirror Assembly Acceptance Test Data

Part 7

Test Flow Event E

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Rev. 3

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DATA SHEET 4.3.7-3: OVERSPEED/UNDERSPEED CHECKS

UNDERSPEED: Adjust for SME(1) SAM MODE to 67000 \pm 100 μ sec (Bumper Mode will be 78692 Nominal)

MODE VOLTAGES:	NORMAL				4.3.7.6. With 20 Ma Load	
	SMA STARTS (✓) LOW HIGH		STABILITY (✓) LOW HIGH		LOW	HIGH
SAMS POP2 SME(1)	✓	✓	✓	✓	✓	✓
SME(2)	✓	✓	✓	✓	✓	✓
BUMPERS QQQ3 SME(1)	✓	✓	✓	✓	✓	✓
SME(2)	✓	✓	✓	✓	✓	✓

OVERSPEED: Adjust for SME(1) SAM MODE to 55000 \pm 100 μ sec Nominal (Bumper Mode will be 64598 sec Nominal)

MODE	NORMAL				4.3.7.6. With 20 Ma Load	
	SMA STARTS (✓) LOW HIGH		STABILITY (✓) LOW HIGH		LOW	HIGH
SAMS POP2 SME(1)	✓	✓	✓	✓	✓	✓
SME(2)	✓	✓	✓	✓	✓	✓
BUMPERS QQQ3 SME(1)	✓	✓	✓	✓	✓	✓
SME(2)	✓	✓	✓	✓	✓	✓

3.3.7.6.1

20 Ma load: INTERNAL CLOCK; NOMINAL VOLTAGES

		STABILITY (✓)	20 Ma Load TA μ sec	No Load TA μ sec
SAMS POP2	SME(1)	✓	1700 μ s	800 μ s
	SME(2)	✓	1700 μ s	800 μ s
BUMPERS QQQ3	SME(1)	✓	1960	880 μ s
	SME(2)	✓	1920 μ s	840 μ s

DATE 1/1/70 QA STAMP (37)
TEST FLOW EVENT E TESTED BY S
COMMENTS _____

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DATA SHEET 4.3.7-4

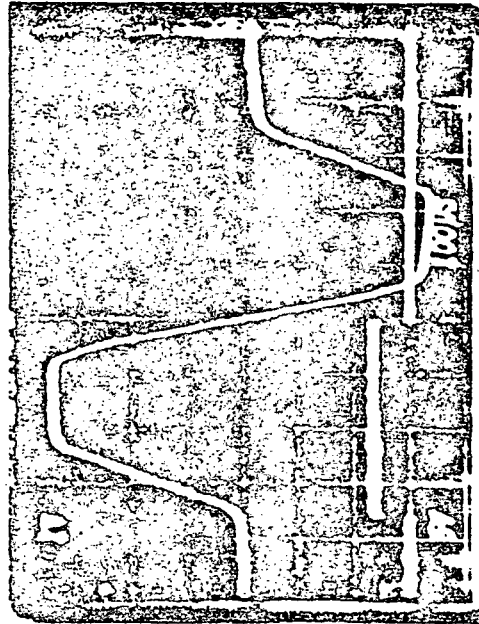
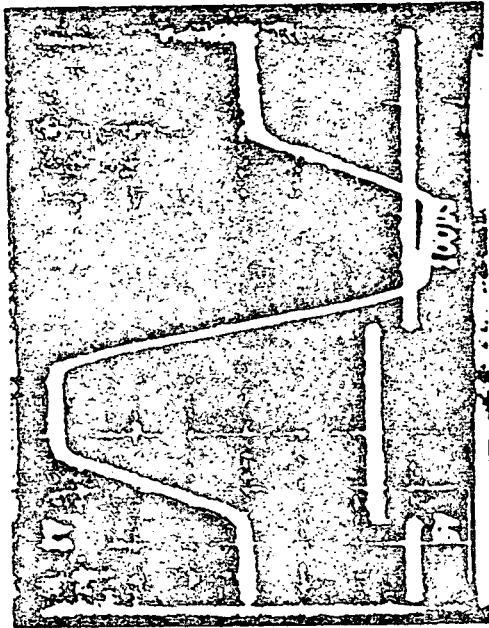
TS 32015-004

Rev. B

SMA Designation E-1

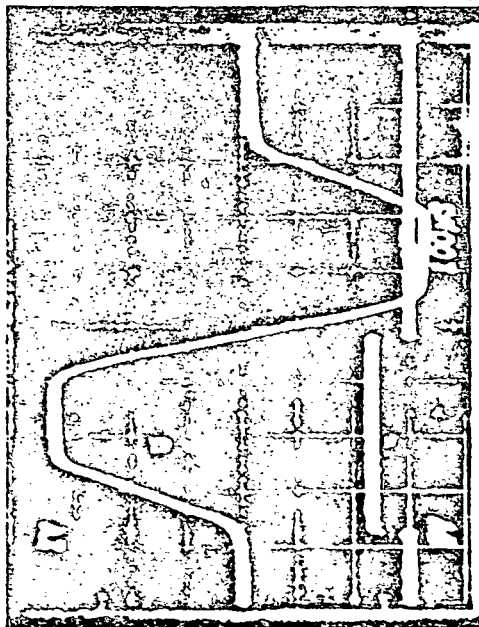
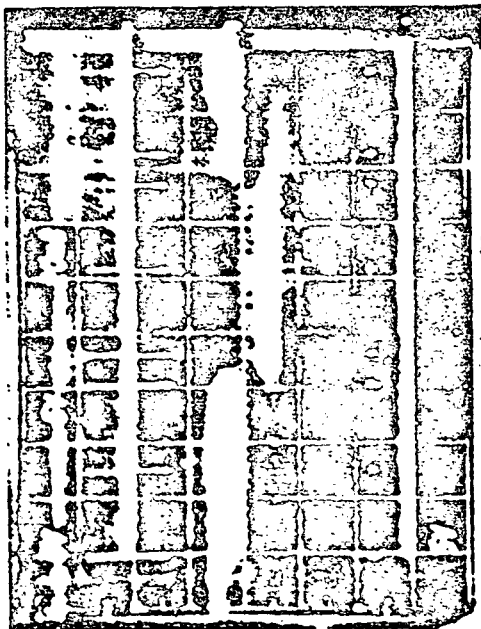
S/N 4

SAM (1) or SME (2)
(Circle one)



LL
AMS
P1
IPA-
ITED
P1

P0
P2
SEPA-
RATED
P2



ALL DC SAMS ϕ 2500 EV S/N 8 Up

Low, high and nominal input voltages checked and SAMS appear the same (A)

Date: 1-30-51 QA Stamp (V-1)

Test Flow Event E

Tested By R.S.

Comments SAM PICTURE A-113 DECISION 4-1-51

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DATA SHEET 4.3.7-4

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Rev. B

SMA Designation

F-1

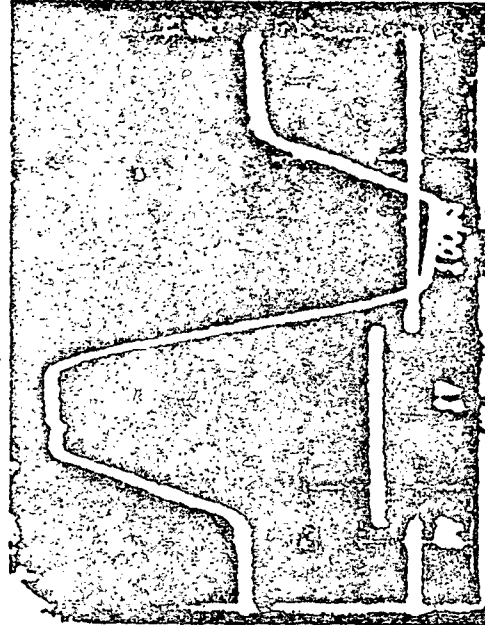
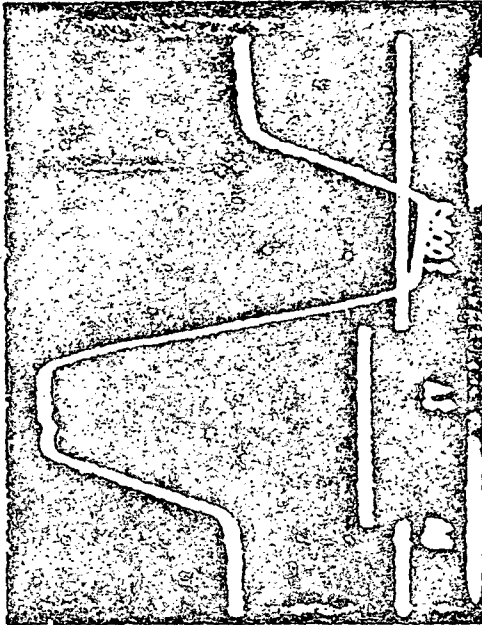
S/N

4

SAM (1) or SME (2)

(Circle one)

11 SECON



ALL
SAMS

P1

SEPA-
RATED

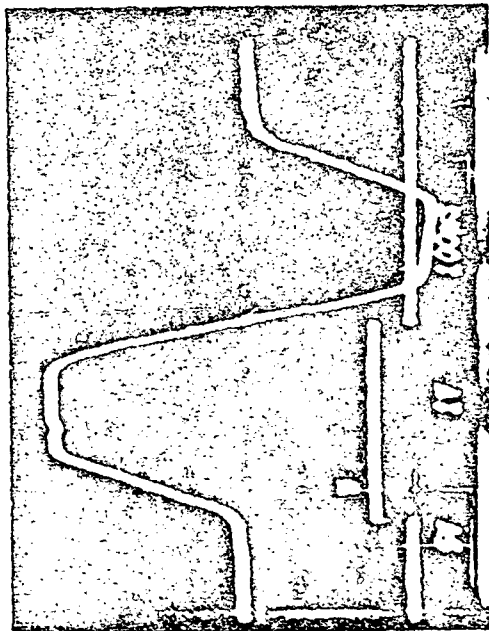
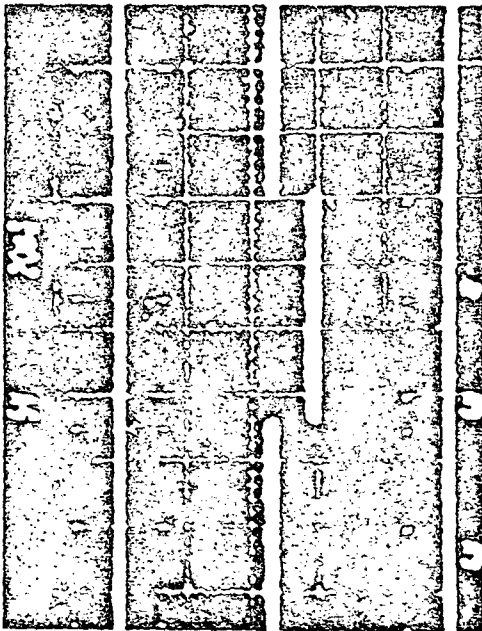
P1

P0

P2

SEPA-
RATED

P2



DC :
SAM

PROC
DIR (TPI)

PROC
PLS (TPI)

22

DC :
SAM

SEPA-
RATED

P0

22

Low, High and nominal input voltage checked and SAMS appear the same 1/4

Date: 1/19/51 QA Stamp

Test Flow Event

Tested By

Comments

ALL DC SAMS + 2500 mv S/N 8 Up

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DATA SHEET 4.3.7-4

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Rev. B

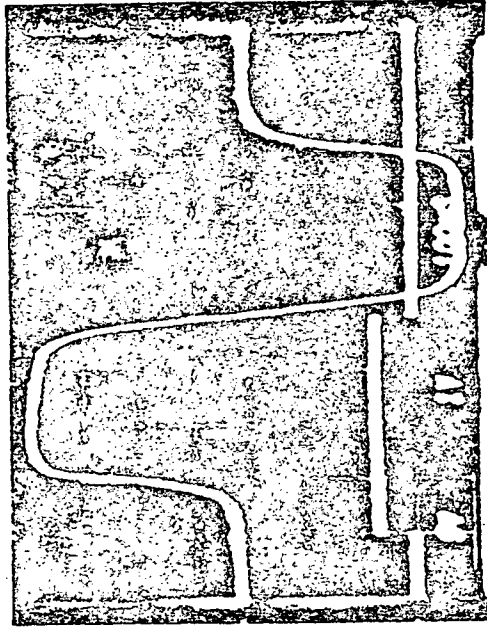
SMA Designation

F-1

S/N

4

SAM (1) or SMC (2)

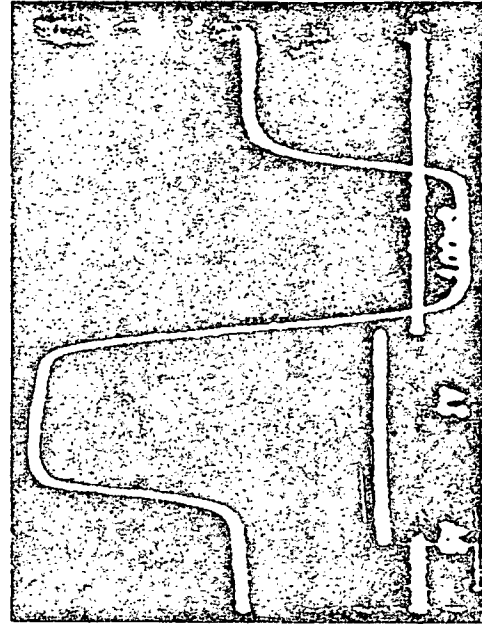


ALL
SAM

P1

SEPA
RATE

P1



P0

P2

SEPA-
RATED

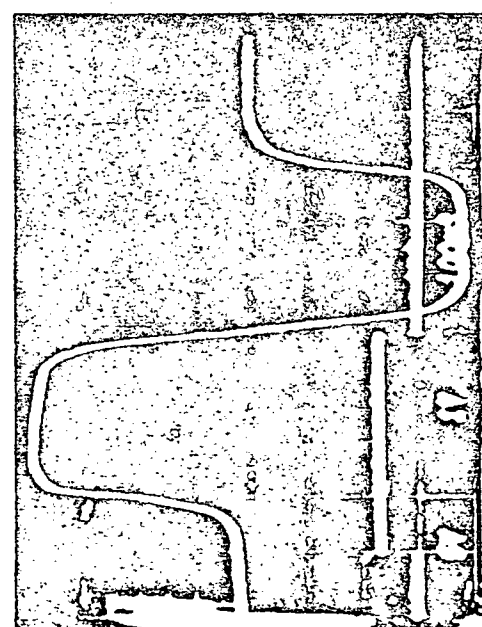
P2



DC
SAM

PROC
DIR (TP)

PROC
PLS (TP)



DC
SAM

SEPA-
RATED

P0

ALL DC SAMs ± 2500 mV S/N & Up

Low, high and nominal input voltages checked and SAMs appear the same (A)

Date: 1/15/51 QA Stamp

Test Flow Event

Tested By

Com

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DATA SHEET 4.3.7-5
DATA PHOTOGRAPHS

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Rev. 3

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SMA Designation

F-1

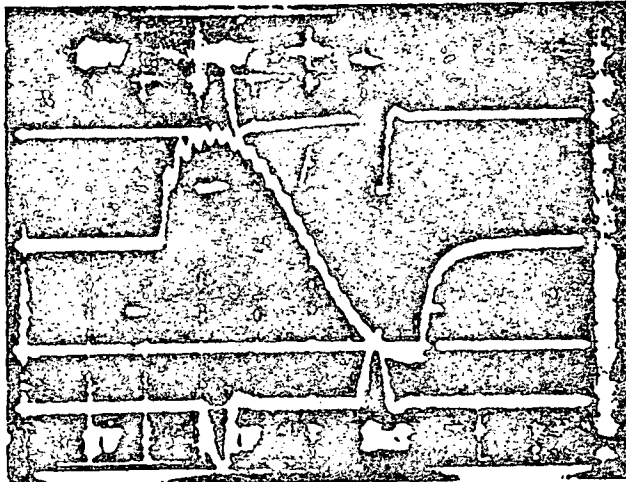
S/N

4

SME (1) or SME (2)

(Circle one)

DC SAM Photographs:



Time base (delayed):
both 2 mser/cm

TOR TP (1 or 2): 10V/cm
20

Bumper A 1.0 V/cm

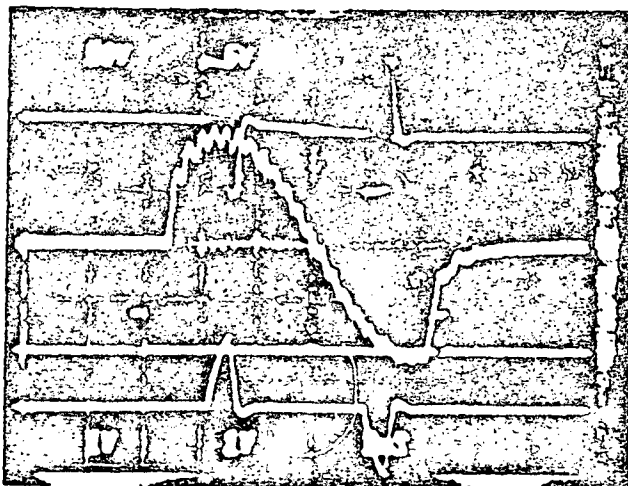
TURNAROUND

1A

P2, P3: 5V/cm

SAM MODE

TOR TP (C): 1.0V/cm



TOR TP (1 or 2): 10V/cm

TURNAROUND

1B

Bumper B 1.0 V/cm SAM MODE

P5, P6 5V/cm

TOR TP (C): 1.0V/cm

Date

1/6/81

QA Stamp

E

Test Flow Event

Tested By

Comments

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DATA SHEET 4.3.7-5
DATA PHOTOGRAPHS

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Rev. B

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SMA Designation

F-T

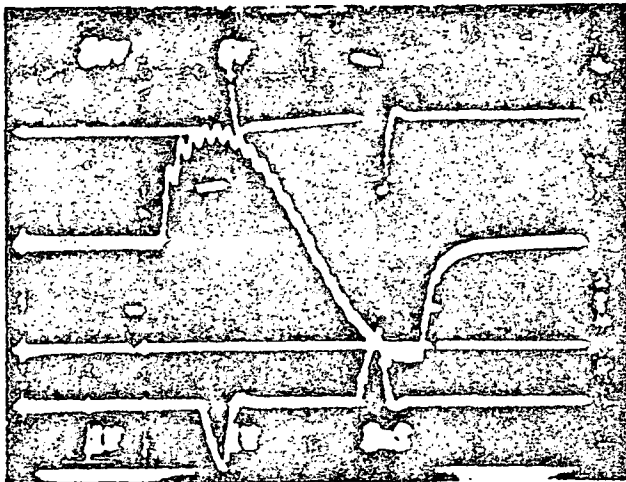
S/N

4

SME (1) or SME (2)

(Circle one)

DC SAM Photographs:



Time base (delayed):
both 2 msec/cm

TOR TP (1 or 2) 10 V/cm

20

Bumper A 1.0 V/cm

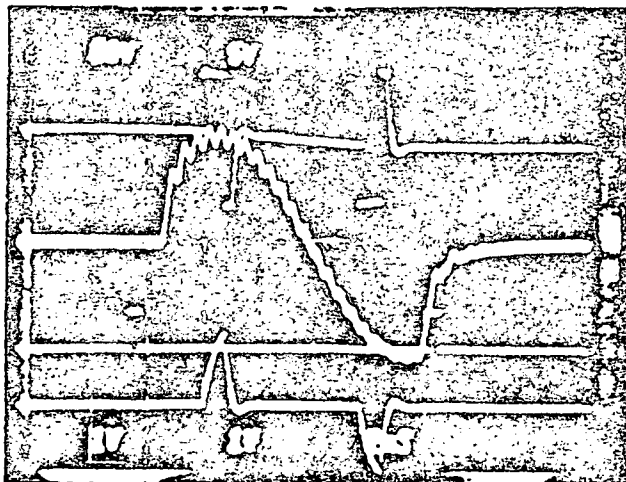
TURNAROUND

1.0 V

P2, P3: 5V/cm

SAM MODE

TOR TP (C): 1.0V/cm



TOR TP (1 or 2) 20 V/cm

TURNAROUND

1.0 V

Bumper B 1.0 V/cm SAM MODE

P5, P6 5V/cm

TOR TP (C): 1.0V/cm

Date

1/10/81

QA Stamp

Test Piece Event

E

Tested By

JP

Comments

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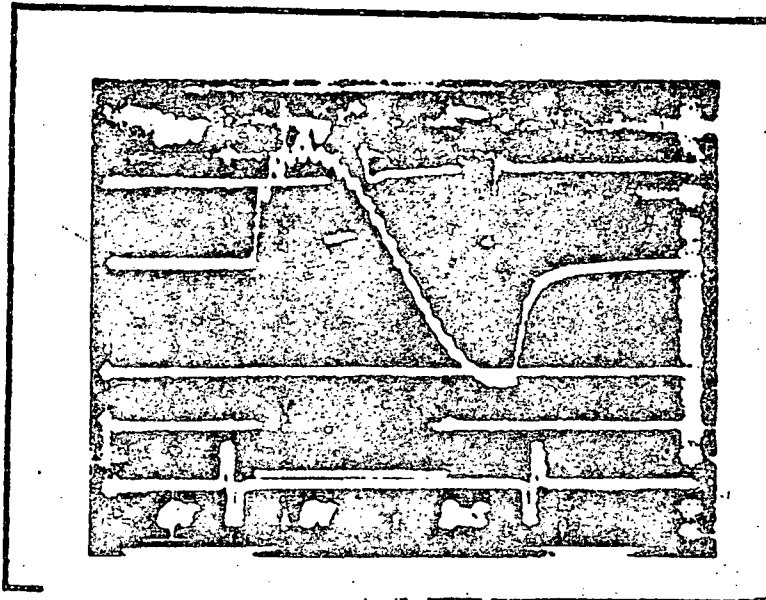
DATA SHEET 4.3.7-6

TS 32015-004

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DATA PHOTOGRAPHS

QA Designation F-1 S/N 4 SHE(1) or SHE(2)
(Circle one)



TQR TP (1) or 2); ²⁰ V/cm

Bumper A; 1.0V/cm

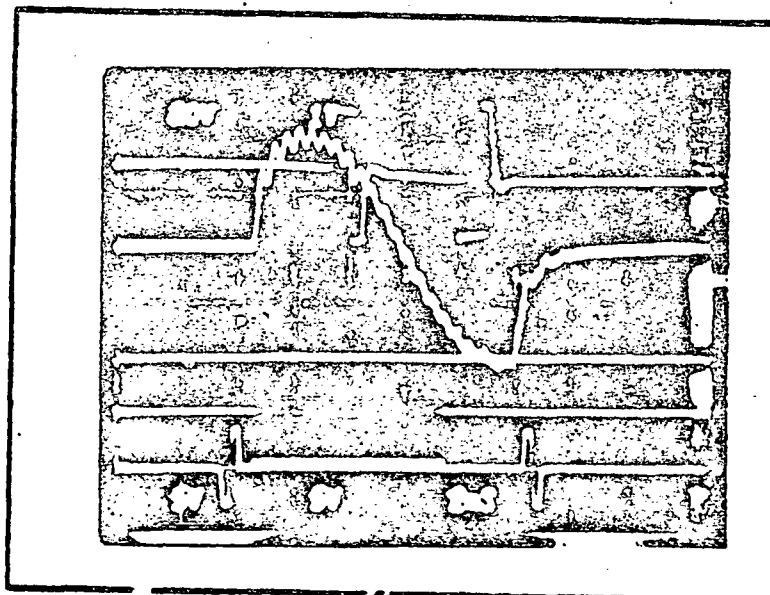
Proc. Q Pulses; TURNAROUND
5V/cm

BUMPER MODE

Raw Fwd TP; 5V/cm

(DOUBLE EXPOSURE)

DC SAM; 5V/cm



TQR TP (1) or 2); ²⁰ V/cm

Bumper B; 1.0V/cm

Proc Q Pulses; TURNAROUND
5V/cm

BUMPER MODE

Raw Fwd TP; 5V/cm

(DOUBLE EXPOSURE)

DC SAM; 5V/cm

1/19/41
Test Flow Event E QA Stamp TS
Comments _____ Tested by TS

ORIGINAL PAGE IS
OF POOR QUALITY

DATA SHEET 4.3.7-6

TS 32015-004

50

DATA PHOTOGRAPHS

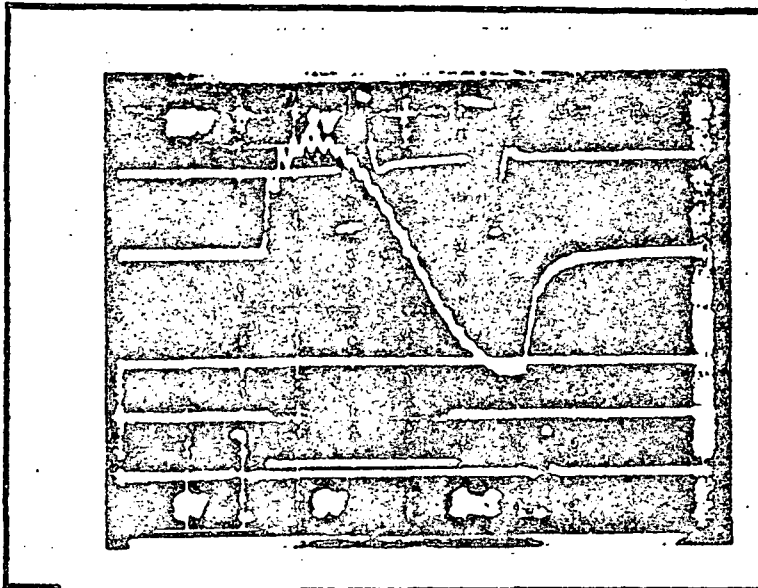
QMA Designation

F-1

S/N

4

SME(1) or SME(2)
(Circle one)



TQR TP (1 or 2); 10 V/cm

Bumper A; 1.0V/cm

Proc. 0 Pulses;
5V/cm

TURNAROUND

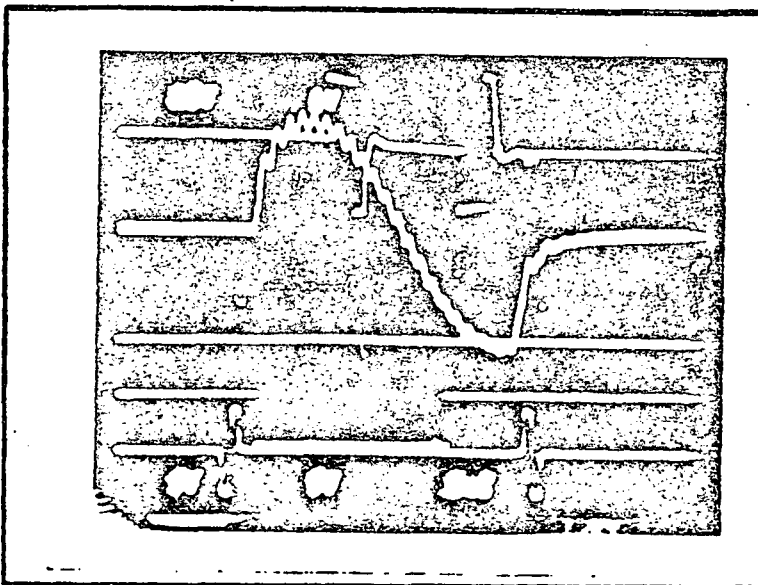
"A"

BUMPER MODE

Raw Fwd TP; 5V/cm

(DOUBLE EXPOSURE)

DC SAM; 5V/cm



TQR TP (1 or 2); 10 V/cm

Bumper B; 1.0V/cm

Proc 0 Pulses;
5V/cm

TURNAROUND

"B"

BUMPER MODE

Raw Fwd TP; 5V/cm

(DOUBLE EXPOSURE)

DC SAM; 5V/cm

Test Flow Event

1/19/81
E

QA Stamp

Tested by

FB

ments

ORIGINAL PAGE IS
OF POOR QUALITY

DATA SHEET 4.3.7-7

DATA PHOTOGRAPHS

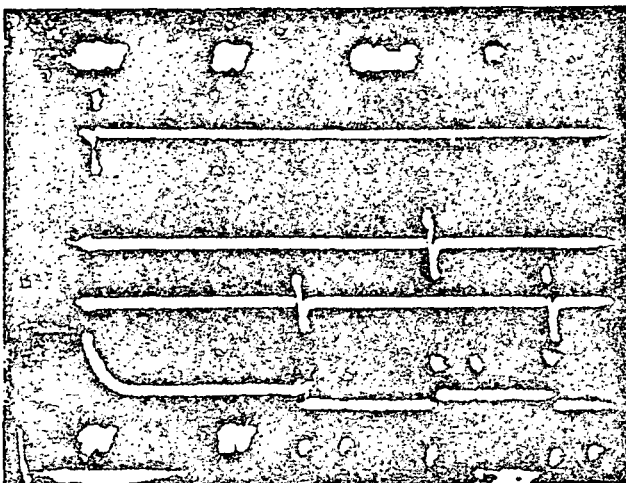
START - UP

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(Circle one)
SME(1) -- SME(2) (BUMPER MODE)

Trigger on TQR TP, Single Sweep, DC, +



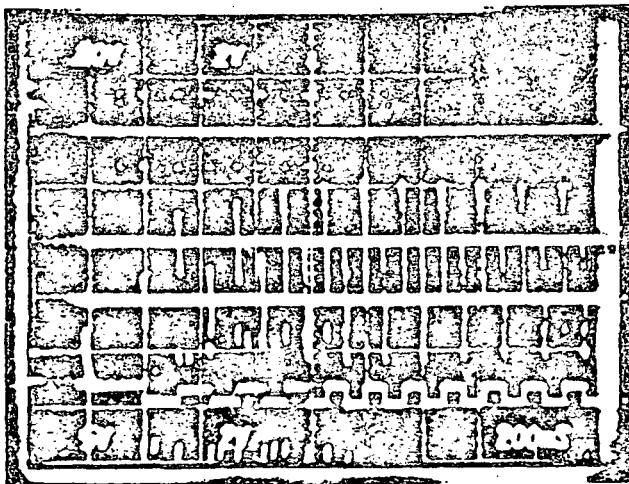
DC SAM, 2.0V/cm

Bumper A, 2.0V/cm

Bumper B, 2.0V/cm First B Pulse
700 mv
Pass/Fail

TQR TP (A or B), 2.0V/cm

Time Base = 50 msec/cm



DC SAM, 2.0V/cm

Bumper A, 2.0V/cm

Bumper B, 2.0V/cm

TQR TP (A or B), 2.0V/cm

Time Base = 200 msec/cm

Date 11/19/81 QA Stamp
Test Flow Event E Tested by
Comments

ORIGINAL PAGE IS
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DATA SHEET 4.3.7-7

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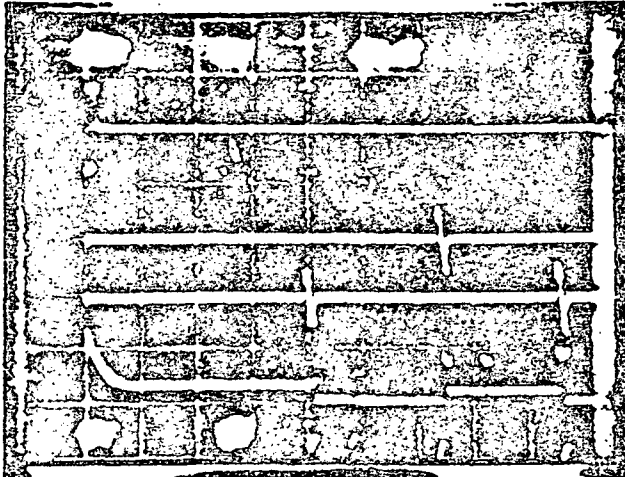
52

DATA PHOTOGRAPHS

START - UP

(Circle one)
SME(1) — SME(2) (BUMPER MODE)

Trigger on TQR TP, Single Sweep, DC, +



DC SAM, 2.0V/cm

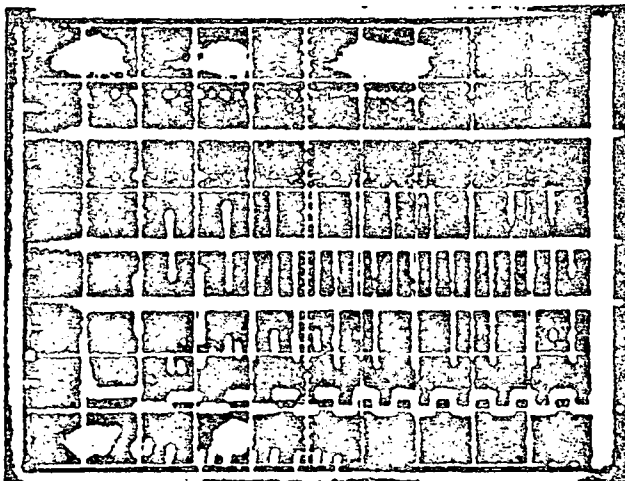
Bumper A, 2.0V/cm

Bumper B, 2.0V/cm First B Pulse

700 mv
Pass/Fail

TQR TP (A or B), 2.0V/cm

Time Base = 50 msec/cm



DC SAM, 2.0V/cm

Bumper A, 2.0V/cm

Bumper B, 2.0V/cm

TQR TP (A or B), 2.0V/cm

Time Base = 200 msec/cm

Date 1/19/81 QA Stamp _____
Test Flow Event E Tested by [Signature]
Comments _____

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Appendix B

Scan Mirror Assembly Acceptance Test Data

Part 8

Test Flow Event F

ORIGINAL PAGE IS
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DATA SHEET 4.2.7-1
OPERABILITY CHECKS
AUTOMATIC TESTS

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Rev B

ATTACH TO DATA SHEET 4.2.7-0 OPERABILITY CHECK - - AUTOMATIC CHECKS
ETC.

attach to data sheet 4.2.7-1 operability check, adjacent instrument, etc.

OPERABILITY CHECK
AUTOMATIC CHECK

SNM destination: P-1 ACCEPT TEST
Serial Number: 4
Form Number: 12081.1531

operation: SNE(1) SNM
Test Flow Event: P-1
Sequence Number: 1

TEMPERATURES T1 T2 T3 T4 T5 T6 T7 T8 T9
(+2) (-2) (+X) (-X) (BPNG) (SRH) (SNE) (VTR) (VTR)
25.9 24.9 25.4 25.7 25.7 26.5 28.6 24.7 24.2
deg C

SNM POWER SUPPLIES measured supply rms measured spec
HOM volts mamps mamps
+27 28.9 30.8 200
-27 -28.8 -28.8 200
-6.8 6.7 6.3 to 7.7 2267.5 2500
P F

BILEVEL DIGITAL SNE(1) OH SNE(2) OH SNE(1) BUFFER(2)
TETENLIT, volts 4.4 0.3 0.3

NOTE SNE(1), SNM

PRESSURE, torr 0.1 req'd <= 2

TORQUE PULSES, sec mean sigma req'd
(100 scans) THH A 885.2 0.6 600 to 1000
THH B 760.5 0.5 600 to 1000

ACTIVE SCAN TIME, msec combined read'd sigma req'd
(100 scans) mean 60742.8
60742.9 to 60743.2 0.5 2.0
P F

TURN-ON TIME, sec 8.3 spec <= 60
Time to reach within 10 msec of active scan time

CS 81200

Tested by

QA Stamp

NO. 8800-22

ORIGINAL PAGE IS
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Date: Date: 11-1-81 Date Time: 1531

SWR: 1.000000 E-1 ACCEPT TEST
Word Number: 4
Scan Time: 12081.1531
Test Flow Error: 0
Sequence Number: 1

SWR MODE operation

scan N: 29 no. of words transferred = 32

Line Length: 1: 375 030 055 000
Port 1 Scan Time: 1: 60743.00
Final Time: 1: 60743.48

TELEMETRY

Byte No	Name	Contents	Pulses	Time(used)
1	SYNC	200		
2	OPSTAT N	006		
3	SONLIN N	130	88	16.58
4	TRNERR N	002 235	669	126.07
5	TORPLS N	350 076	-4034	-760.21
6	SHSERR N-1	377 323	-45	-8.48
7	PHSERR N-1	000 055	45	8.48
8	SONCTR N-1	377 360 076	-4034	-760.21
9	SONLIN N-1	003 354		
10	TRNERR N-1	130	-88	-16.58
11	TORPLS N-1	002 135	605	114.01
12	SHSERR N-1	357 122	-4270	-804.87
13	PHSERR N-2	000 063	51	9.61
14	SONCTR N-2	377 320	-48	-9.05
15	SONERR N-2	377 357 121	-4271	-804.87
16	SONTYM N-2	004 353 036	322326	60742.45
17	NBSCANS	037	No.Scans =	31 (decimal)

Bit 7 = 0: Scan N= Forward

scan N:100 no. of words transferred = 31

Line Length: 1: 003 037 316 377
Port 1 Scan Time: 1: 60743.19
Final Time: 1: 60743.30

TELEMETRY

Byte No	Name	Contents	Pulses	Time(used)
1	SYNC	200		
2	OPSTAT N	206		
3	SONLIN N	250	-88	-16.58
4	TRNERR N	002 135	605	114.01
5	TORPLS N	357 117	-4270	-805.25
6	SHSERR N-1	000 061	49	9.23
7	PHSERR N-1	377 316	-50	-9.42
8	SONCTR N-1	377 357 121	-4271	-804.87
9	SONCTR	003 355		
10	SONLIN N-1	130	88	16.58
11	TRNERR N-1	002 235	669	126.07
12	TORPLS N-1	350 076	-4034	-760.21
13	SHSERR N-2	377 323	-45	-8.48
14	PHSERR N-2	000 055	45	8.48
15	SONERR N-2	377 360 076	-4034	-760.21
16	SONTYM N-2	004 353 031	322329	60743.01
17	NBSCANS	037	No.Scans =	31 (decimal)

Bit 7 = 1: Scan N= Reverse

ORIGINAL PAGE IS
OF POOR QUALITY

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TS 32015-0044
Rev. B

DATA SHEET 4.3.7-2: OPERABILITY CHECKS

Manual Tests

SMA Designation F-1 S/N 4 SWE(1)(b) ✓ SWE(2)(b) ✓

Step

(a)

MUX Pulse Interfaces

Place check in blocks indicated after observing the waveform (see Figure 4.3-12). The signal low should be 40 ± 40 m volts, and the signal high should be 680 ± 40 mV. The pulse duration should be from 300 μ sec to 400 μ sec. (For Pseudo SAMS just confirm their presence with a check)

SIGNAL	SWITCH POSITION	NORM	SWITCH POSITION	COMPLEMENT	PSEUDO (48 μ sec)
Pulses	3 or 7	✓	4 or 8	✓	✓
Direction	1 or 5	✓	2 or 6	✓	✓

(b)

"SWE 1 ON MUX":

IF SWE (1) IS ON (✓)

IF SWE (2) IS ON (✓)

Logic 1

4.5 to 5.5 volts ✓

Logic 0

0 to 0.8 volt Pass ✓ Fail

Date 1/20/81 QA Stamp 

Test File Event F Tested by ✓

Comments _____

No. Req'd = 20

ORIGINAL PAGE IS
OF POOR QUALITY

DATA SHEET 4.3.7-1
OPERABILITY CHECKS
AUTOMATIC TESTS

TS 32015-004

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Rev 8

ATTACH TO DATA SHEET 4.3.7-1 OPERABILITY CHECKS - AUTOMATIC CHECKS
ETC...

attach to data sheet 4.3.7-1 operability check (intermediate) (10/1/71) (10/1/71) (10/1/71)

OPERABILITY CHECK
AUTOMATIC CHECK

SNA Designation: F-1 ACCEPT TEST
Serial Number: 4
Run Number: 12081.1538
Operation: SNE(1) BUMPER
Test Flow Event: F-3
Sequence Number: 1

TEMPERATURES
T1 T2 T3 T4 T5 T6 T7 T8 T9
(+Z) (-Z) (+Z) (-Z) (+Z) (-Z) (+Z) (-Z) (+Z) (-Z)
26.0 24.9 25.4 25.8 25.7 26.6 28.8 24.2 24.2
deg C

SNA POWER SUPPLIES
measured supply rns measured spec
NON volts mamps mamps
+27 28 to 30 29.6 200
-27 -28 to -30 27.2 200
-6.8 6.3 to 7.7 2264.9 2500
P F

BILEVEL DIGITAL
TELEMETRY, volts
SNE(1) ON SNE(2) ON SNA(1)/BUMPER(2)
4.4 0.5 0.3

MODE
SNE(1), BUMPER

PRESSURE, torr
0.6 req'd <= 2

TORQUE PULSES, usec
(100 scans) mean sigma req'd
TAU A 877.9 0.8 ---
TAU B 868.8 0.9 ---

BUMPER-BUMPER TIME, usec combined
(100 scans) mean req'd sigma
71342.9 to 71343.8 0.8 2.9 P P

TURN-ON TIME, sec
(time to reach within 10 usec of active scan line)
7.9 spec <= 60 P

Tested by

QA Stamp

ORIGINAL PAGE IS
OF POOR QUALITY

Data Date: 01-01-77 Data Time: 1538

S/F Description: F-1 ACCEPT TEST

Serial Number: 1

Run Number: 12081.1538

Test Flow Sheet: F

Sequence Number: 1

BUMPER MODE operation

Scan N: 99 no. of words transferred = 32

Line Length, N-1: 005 365 325 000

Bumper to Bumper Time, N-1: 71343.7

Final Time, N: 60743.11

TELEMETRY

Byte No	Name	Contents	Pulses	Time(us)
1	SYNC	200		
2	OPSTAT N	046	Bit 7 = 0: Scan N= Forward	
3	SCHLIN N	130	88	16.58
4	TRNERR N	000 000	0	0.00
5	TOPPLS N	355 366	-4618	-870.26
6	SHSEPR N-1	000 000	0	0.00
7	PHSEPR N-1	000 000	0	0.00
8	SUMERR N-1	377 355 371	-4615	-869.70
9	SCHCTR	003 161		
10	SCHLIN N-1	250	-88	-16.58
11	TRNERR N-1	000 000	0	0.00
12	TOPPLS N-1	355 310	-4664	-878.93
13	SHSEPR N-2	000 000	0	0.00
14	PHSEPR N-2	000 000	0	0.00
15	SUMERR N-2	377 355 315	-4659	-877.99
16	SCHTYM N-2	004 353 037	322335	60744.14
17	NSCANB	037	No.Scans =	31 (decimal)

Scan N: 100 no. of words transferred = 31

Line Length, N-1: 005 306 320 377

Bumper to Bumper Time, N-1: 71342.8

Final Time, N: 60743.11

TELEMETRY

Byte No	Name	Contents	Pulses	Time(us)
1	SYNC	200		
2	OPSTAT N	246	Bit 7 = 1: Scan N= Reverse	
3	SCHLIN N	250	-88	-16.58
4	TRNERR N	000 000	0	0.00
5	TOPPLS N	355 313	-4661	-878.37
6	SHSEPR N-1	000 000	0	0.00
7	PHSEPR N-1	000 000	0	0.00
8	SUMERR N-1	377 355 313	-4661	-878.37
9	SCHCTR	003 161		
10	SCHLIN N-1	130	88	16.58
11	TRNERR N-1	000 000	0	0.00
12	TOPPLS N-1	355 366	-4618	-870.26
13	SHSEPR N-2	000 000	0	0.00
14	PHSEPR N-2	000 000	0	0.00
15	SUMERR N-2	377 355 371	-4615	-869.70
16	SCHTYM N-2	004 353 035	322333	60743.77
17	NSCANB	037	No.Scans =	31 (decimal)

ORIGINAL PAGE IS
OF POOR QUALITY

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TS 32013-004
Rev. B

DATA SHEET 4.3.7-2: OPERABILITY CHECKS

Manual Tests

SMA Designation F-1 S/N 41 SME(1) (b) ✓ SME(2) (b)

Step

Bmpr

(a)

MUX Pulse Interfaces

Place check in blocks indicated after observing the waveform (see Figure 4.3-12). The signal low should be 40 ± 40 mV, and the signal high should be 680 ± 40 mV. The pulse duration should be from 300 μ sec to 400 μ sec. (For Pseudo SAMS just confirm their presence with a check)

SIGNAL	SWITCH POSITION	NORM	SWITCH POSITION	COMPLEMENT	PSEUDO (48 μ sec)
Pulses	3 or 7	✓	4 or 8	✓	✓
Direction	1 or 5	✓	2 or 6	✓	✓

(b)

"SME 1 ON MUX":

IF SME (1) is ON (✓)

IF SME (2) is ON (✓)

Logic 1

4.5 to 5.5 volts ✓

Logic 0

0 to 0.8 volt Pass ✓ Fail

Date 1/20/81 QA Stamp (Stamp)

Test Flow Event F Tested by (Signature)

Comments _____

No. Req'd = 20

DATA SHEET 4.2.7-1
OPERABILITY CHECKS
AUTOMATIC TESTS

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ATTACH TO DATA CASSSET 42.D-1

attach to data sheet 4.3.7-1 operability check, 230000T-FM, v1.0, file 2, row 1210000

OPERABILITY CHECK
AUTOMATIC CHECK

SHM Designation: F-1 ACCEPT TEST
Serial Number: 4
Run Number: 12081.1544
operation: SHE(2) SHM
Test Flow Event: F-5
Sequence Number: 1
INFORMATION CHECK

TEMPERATURES	T1 (+Z)	T2 (-Z)	T3 (+X)	T4 (-X)	T5 (BRIG)	T6 (SH)	T7 (SNE)	T8 (-Z, X, +Z, S)	T9
deg C	26.1	24.9	25.4	25.8	25.7	26.6	28.9	24.2	24.2

SEMA POWER SUPPLIES	measured VOM	supply rms volts	measured watts	spec watts	eff
+27	28.9	28 to 30	27.6	300	0.9
-27	28.8	28 to 30	26.2	300	0.9
-6.8	6.7	6.3 to 7.7	1451.5	2500	0.6

500 LEVEL DIGITAL TELEMETRY, volts	SME(1) ON	SME(2) ON	SAN(1) BUFFER(2)
	0.5	4.4	0.3

INDEX

```

PRESSURE, torr      0.6      read <= 2

```

TORQUE PULSES, used (100 zone)	mean	sigma	req'd
TAU A	803.0	0.7	600 to 1000
TAU B	760.4	0.6	600 to 1000

ACTIVE STACK TIME, msec (100 scans)	combined mean	req'd to 60742.9	std 60742.8	req'd to 60743.2	req'd 2.9
--	------------------	---------------------	----------------	---------------------	--------------

TURN-ON TIME, sec	8.3	spec <= 60
(Time to reach within 10usec of active scan time)		

Tested by

QA Stamp

MAC
-69T

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ORIGINAL PAGE 18
OF POOR QUALITY

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Data Date: 01001 Data Time: 1544

SRP Test: 01001 F-1 ACCEPT TEST
Serial Number: 2
Number: 10081.1544
Test Flow End: F
Sequence Number: 1

SRM MODE iteration

scan N: 55 no. of words transferred = 32

Line Length: N-1: 374 340 055 000
Active Scan Time: N-1: 60743.94
Final Time: N: 60743.67

TELEMETRY

Byte No	Name	Contents	Pulses	Time(used)
1	SRM	246		
2	OPSTAT N	106		
3	SCHLIN N	130	88	16.58
4	TRNERR N	002 036	734	138.02
5	TORPLS N	357 073	-4037	-760.77
6	SHSERR N-1	377 316	-50	-9.42
7	PHSERR N-1	000 055	45	8.48
8	SUMERR N-1	377 360 100	-4032	-759.83
9	SONCTR N-1	007 226		
10	SCHLIN N-1	130	-88	-16.58
11	TRNERR N-1	002 153	619	116.65
12	TORPLS N-1	357 135	-4259	-802.61
13	SHSERR N-2	000 057	47	8.86
14	PHSERR N-2	377 315	-51	-9.61
15	SUMERR N-2	377 357 140	-4256	-802.04
16	SONCTR N-2	004 253 035	322333	60743.77
17	NSCANS	037	No.Scans =	31 (decimal)

Bit 7 = 0: Scan N= Forward

Handwritten: 1062

scan N:100 no. of words transferred = 31

Line Length: N-1: 003 017 316 377
Active Scan Time: N-1: 60743.38
Final Time: N: 60743.67

TELEMETRY

Byte No	Name	Contents	Pulses	Time(used)
1	SRM	246		
2	OPSTAT N	306		
3	SCHLIN N	250	-88	-16.58
4	TRNERR N	002 153	619	116.65
5	TORPLS N	357 133	-4261	-802.99
6	SHSERR N-1	000 060	48	9.05
7	PHSERR N-1	377 316	-50	-9.42
8	SUMERR N-1	377 357 135	-4259	-802.61
9	SONCTR N-1	007 227		
10	SCHLIN N-1	130	88	16.58
11	TRNERR N-1	002 336	734	138.02
12	TORPLS N-1	357 073	-4037	-760.77
13	SHSERR N-2	377 316	-50	-9.42
14	PHSERR N-2	000 055	45	8.48
15	SUMERR N-2	377 360 100	-4032	-759.83
16	SONCTR N-2	004 253 035	322334	60743.95
17	NSCANS	037	No.Scans =	31 (decimal)

Bit 7 = 1: Scan N= Reverse

ORIGINAL PAGE IS
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TS 32015-0044
Rev. B

DATA SHEET 4.3.7-2: OPERABILITY CHECKS

Manual Tests

SMA Designation F-1 S/N 41 SME(1) (b) SME(2) (b) ✓

Step

(a)

MUX Pulse Interfaces

Place check in blocks indicated after observing the waveform (see Figure 4.3-12). The signal low should be 40 ± 40 m volts, and the signal high should be 680 ± 40 m v. The pulse duration should be from 300 μ sec to 400 μ sec. (For Pseudo SAMS just confirm their presence with a check)

SIGNAL	SWITCH POSITION	NORM	SWITCH POSITION	COMPLEMENT	PSEUDO (48 μ sec)
Pulses	3 or 7	✓	4 or 8	✓	✓
Direction	1 or 5	✓	2 or 6	✓	✓

(b)

"SME 1 ON MUX":

IF SME (1) is ON (✓)

IF SME (2) is ON (✓)

Logic 1

4.5 to 5.5 volts

Logic 0

0 to 0.8 volt ✓ Pass ✓ Fail

Date 1/20/81 QA Stamp

Test Flow Event F Tested by (b)

Comments

No. Req'd = 20

ORIGINAL PAGE IS
OF POOR QUALITY

DATA SHEET 4.3.7-1
OPERABILITY CHECKS
AUTOMATIC TESTS

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ATTACH TO DATA SHEET 4.3.7-1 OPERABILITY CHECKS - - - AUTOMATIC CHECKS
ETC. - - -

attach to data sheet 4.3.7-1 operability check, 2; tapent-FMstrk0, file2, rev 1218

OPERABILITY CHECK
AUTOMATIC CHECK

SMA Designation: F-1 ACCEPT TEST
Serial Number: 4
Run Number: 12081.1553
Operation: SMC(2) BUMPER
Test Flow Event: F-7
Sequence Number: 1

TEMPERATURES
deg C
T1 (+Z) 26.1
T2 (-Z) 24.9
T3 (+X) 25.5
T4 (-X) 25.8
T5 (BRIG) (SAM) 25.7
T6 (SME) 26.6
T7 (-Z-W) 29.1
T8 (-Z-W) 24.2
T9 (+Z-W) 24.2

SMA POWER SUPPLIES
measured: NOM
+27 28.9
-27 -28.8
-6.8 6.7
supply rms volts
28 to 30
-28 to -30
6.3 to 7.7
measured: WATTS
28.4
27.1
1871.0
spec: WATTS
200
200
2500
P/F
P
P
P

BILEVEL DIGITAL
TELEMETRY, volts
SME(1) ON 0.3
SME(2) ON 4.4
SAM(1) BUMPER(2) 3.9

MODE
SME(2), BUMPER

PRESSURE, torr
0.7
req'd <= 2

TORQUE PULSES, usec
(100 scans) TRU A 841.9
TRU B 588.2
mean
sigma
req'd
0.9
1.2

BUMPER-BUMPER TIME, usec combined
(100 scans) 71342.9
mean
sigma
req'd
71342.2
to 71343.8
0.9
2.9
P P

TURN-ON TIME, sec
(time to reach within 10usec of active scan time)
7.9
spec <= 60
P

Tested by

QA Stamp

NO. REC'D

SMA Designation: F-1 ACCEPT TEST
 Part Number: 1
 Lot Number: 1001.1001
 Test Flow Chart: 1
 Sequence Number: 1

EST 102

[illegible]

```

Line Length: 605 305 318 000
Branch to Branch Length: 71342.4
Final Time: 50743.11

```

Line No.	HL	Contents	Falses	Time(used)
1	0	0000	145	
2	0	001001 N	146	
3	0	000111 N	130	
4	0	000000 N	000 000	
5	0	000010 N	355 135	
6	0	000000 N-1	000 000	
7	0	000000 N-1	000 000	
8	0	000000 N-1	000 000	
9	0	000000 N-1	000 000	
10	0	000000 N-1	377 355 134	
11	0	000000 N-1	000 146	
12	0	000000 N-1	150	
13	0	000000 N-1	000 000	
14	0	000000 N-1	355 223	
15	0	000000 N-2	000 000	
16	0	000000 N-2	000 000	
17	0	000000 N-2	000 000	
18	0	000000 N-2	377 355 217	
19	0	000000 N-2	004 353 032	
20	0	000000 N-2	007	
21	0	000000 N-2	007	
22	0	000000 N-2	007	
23	0	000000 N-2	007	
24	0	000000 N-2	007	
25	0	000000 N-2	007	
26	0	000000 N-2	007	
27	0	000000 N-2	007	
28	0	000000 N-2	007	
29	0	000000 N-2	007	
30	0	000000 N-2	007	
31	0	000000 N-2	007	
32	0	000000 N-2	007	
33	0	000000 N-2	007	
34	0	000000 N-2	007	
35	0	000000 N-2	007	
36	0	000000 N-2	007	
37	0	000000 N-2	007	
38	0	000000 N-2	007	
39	0	000000 N-2	007	
40	0	000000 N-2	007	
41	0	000000 N-2	007	
42	0	000000 N-2	007	
43	0	000000 N-2	007	
44	0	000000 N-2	007	
45	0	000000 N-2	007	
46	0	000000 N-2	007	
47	0	000000 N-2	007	
48	0	000000 N-2	007	
49	0	000000 N-2	007	
50	0	000000 N-2	007	
51	0	000000 N-2	007	
52	0	000000 N-2	007	
53	0	000000 N-2	007	
54	0	000000 N-2	007	
55	0	000000 N-2	007	
56	0	000000 N-2	007	
57	0	000000 N-2	007	
58	0	000000 N-2	007	
59	0	000000 N-2	007	
60	0	000000 N-2	007	
61	0	000000 N-2	007	
62	0	000000 N-2	007	
63	0	000000 N-2	007	
64	0	000000 N-2	007	
65	0	000000 N-2	007	
66	0	000000 N-2	007	
67	0	000000 N-2	007	
68	0	000000 N-2	007	
69	0	000000 N-2	007	
70	0	000000 N-2	007	
71	0	000000 N-2	007	
72	0	000000 N-2	007	
73	0	000000 N-2	007	
74	0	000000 N-2	007	
75	0	000000 N-2	007	
76	0	000000 N-2	007	
77	0	000000 N-2	007	
78	0	000000 N-2	007	
7				

scan 0:100 no. of words transferred = 31

```

Lanes Length-N-1:      005 306 321 377
Blower to Blower Time,N-1:      71343.0
Final Time:ns         60743.11

```

Byte No	Name	Contents	Pulses	Time(us)
1	SYN0	346		
2	OPSTAT N=	346	Bit 7 = 1: Scan N= Reverse	
3	SONLIN N=	250	-88	-16.58
4	TENERR N=	000 000	0	0.00
5	TORPLE N=	355 230	-4464	-841.24
6	PHSERR N=1	000 000	0	0.00
7	PHSERR N=1	000 000	0	0.00
8	PHSERR N=1	000 000	0	0.00
9	PHSERR N=1	000 000	0	0.00
10	PHSERR N=1	000 000	0	0.00
11	PHSERR N=1	000 000	0	0.00
12	PHSERR N=1	000 000	0	0.00
13	PHSERR N=1	000 000	0	0.00
14	PHSERR N=1	000 000	0	0.00
15	PHSERR N=1	000 000	0	0.00
16	PHSERR N=1	000 000	0	0.00
17	PHSERR N=1	000 000	0	0.00
18	PHSERR N=1	000 000	0	0.00
19	PHSERR N=1	000 000	0	0.00
20	PHSERR N=1	000 000	0	0.00
21	PHSERR N=1	000 000	0	0.00
22	PHSERR N=1	000 000	0	0.00
23	PHSERR N=1	000 000	0	0.00
24	PHSERR N=1	000 000	0	0.00
25	PHSERR N=1	000 000	0	0.00
26	PHSERR N=1	000 000	0	0.00
27	PHSERR N=1	000 000	0	0.00
28	PHSERR N=1	000 000	0	0.00
29	PHSERR N=1	000 000	0	0.00
30	PHSERR N=1	000 000	0	0.00
31	PHSERR N=1	000 000	0	0.00
32	PHSERR N=1	000 000	0	0.00
33	PHSERR N=1	000 000	0	0.00
34	PHSERR N=1	000 000	0	0.00
35	PHSERR N=1	000 000	0	0.00
36	PHSERR N=1	000 000	0	0.00
37	PHSERR N=1	000 000	0	0.00
38	PHSERR N=1	000 000	0	0.00
39	PHSERR N=1	000 000	0	0.00
40	PHSERR N=1	000 000	0	0.00
41	PHSERR N=1	000 000	0	0.00
42	PHSERR N=1	000 000	0	0.00
43	PHSERR N=1	000 000	0	0.00
44	PHSERR N=1	000 000	0	0.00
45	PHSERR N=1	000 000	0	0.00
46	PHSERR N=1	000 000	0	0.00
47	PHSERR N=1	000 000	0	0.00
48	PHSERR N=1	000 000	0	0.00
49	PHSERR N=1	000 000	0	0.00
50	PHSERR N=1	000 000	0	0.00
51	PHSERR N=1	000 000	0	0.00
52	PHSERR N=1	000 000	0	0.00
53	PHSERR N=1	000 000	0	0.00
54	PHSERR N=1	000 000	0	0.00
55	PHSERR N=1	000 000	0	0.00
56	PHSERR N=1	000 000	0	0.00
57	PHSERR N=1	000 000	0	0.00
58	PHSERR N=1	000 000	0	0.00
59	PHSERR N=1	000 000	0	0.00
60	PHSERR N=1	000 000	0	0.00
61	PHSERR N=1	000 000	0	0.00
62	PHSERR N=1	000 000	0	0.00
63	PHSERR N=1	000 000	0	0.00
64	PHSERR N=1	000 000	0	0.00
65	PHSERR N=1	000 000	0	0.00
66	PHSERR N=1	000 000	0	0.00
67	PHSERR N=1	000 000	0	0.00
68	PHSERR N=1	000 000	0	0.00
69	PHSERR N=1	000 000	0	0.00
70	PHSERR N=1	000 000	0	0.00
71	PHSERR N=1	000 000	0	0.00
72	PHSERR N			

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Rev. B

DATA SHEET 4.3.7-2: OPERABILITY CHECKS

Manual Tests

SMA Designation F-1 S/N 4 SME(1) (✓) SME(2) (✓)
Step Brpr

(a)

MUX Pulse Interfaces

Place check in blocks indicated after observing the waveform (see Figure 4.3-12). The signal low should be 40 ± 40 m volts, and the signal high should be 680 ± 40 m v. The pulse duration should be from 300 μ sec to 400 μ sec. (For Pseudo SAMS just confirm their presence with a check)

SIGNAL	SWITCH POSITION	NORM	SWITCH POSITION	COMPLEMENT	PSEUDO (48 μ sec)
Pulses	3 or 7	✓	4 or 8	✓	✓
Direction	1 or 5	✓	2 or 6	✓	✓

(b)

"SME 1 ON MUX":

IF SME (1) is ON (✓)

IF SME (2) is ON (✓)

Logic 1

4.5 to 5.5 volts

Logic 0

0 to 0.8 volt ✓ Pass ✓ Fail

Date 1/20/81 QA Stamp (Stamp)

Test Flow Event 15 Tested by (Signature)

Comments

No. Req'd = 20

Appendix B

Scan Mirror Assembly Acceptance Test Data

Part 9

Test Flow Event G

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DATA SHEET 4.3.7-1
OPERABILITY CHECKS
AUTOMATIC TESTS

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Rev B

ATTACH TO DATA SHEET 4.3.7-1 OPERABILITY CHECKS - AUTOMATIC CHECKS
ETC...

attach to data sheet 4.3.7-1 operability checks; tape AT-FM, trk 0, file 2, repl 118

OPERABILITY CHECK
AUTOMATIC CHECK

SMA Designation: F-1 ACCEPT TEST operation: SNE(1) SAM
Serial Number: 4 Test Flow Event: G-1
Run Number: 12181.1148 Sequence Number: 1

TEMPERATURES T1 T2 T3 T4 T5 T6 T7 T8 T9
(+Z) (-Z) (+X) (-X) (BRIG) (SAM) (SNE) (-Z-X) (+Z+)
deg C 26.1 24.7 25.2 25.5 25.3 26.4 29.1 24.1 24.

SMA POWER SUPPLIES measured supply rms measured spec P/F
HOM volts mamps
+27 28.9 28 to 30 28.3 200 P
-27 -29.8 -28 to -30 26.4 200 P
-6.8 6.8 to 7.7 1699.4 2500 P

LEVEL DIGITAL SNE(1) ON SNE(2) ON SAM(1)/BUMPER(2)
ELEMETRY, volts 4.4 0.3 3.9

MODE SNE(1), SAM

PRESSURE, torr 0.5 req'd <= 2 P

ORQUE PULSES, usec mean sigma req'd
(100 scans) THU A 804.5 0.4 600 to 1000 P
THU B 755.3 0.4 600 to 1000 P

ACTIVE SCAN TIME, usec combined req'd sigma req'd
(100 scans) mean 60742.8
60742.9 to 60743.2 0.5 2.9 P P

TURN-ON TIME, sec 7.9 spec <= 60 P
(time to reach within 10usec of active scan time)

Tested by

QA Stamp

4.3.7-1-2

66

10

10

10

10

10

10

10

10

10

10

10

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Rev. B

DATA SHEET 4.3.7-2: OPERABILITY CHECKS

Manual Tests

SMA Designation F-1 S/N 4 SWE(1) (b) SWE(2) (b)

Step

(a)

MUX Pulse Interfaces

Place check in blocks indicated after observing the waveform (see Figure 4.3-12). The signal low should be 40 ± 40 m volts, and the signal high should be 680 ± 40 mV. The pulse duration should be from 300 μ sec to 400 μ sec. (For Pseudo SAMS just confirm their presence with a check)

SIGNAL	SWITCH POSITION	NORM	SWITCH POSITION	COMPLEMENT	PSEUDO (48 μ sec)
Pulses	3 or 7	<input checked="" type="checkbox"/>	4 or 8	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Direction	1 or 5	<input checked="" type="checkbox"/>	2 or 6	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

(b)

"SME 1 ON MUX":

Logic 1

Logic 0

IF SME (1) is ON ☒

4.5 to 5.5 volts ☒

IF SME (2) is ON ☒

0 to 0.8 volt ☒ Pass ☒ Fail

Date 1/20/81 QA Stamp



Test Flow Event G Tested by [Signature]

Comments _____

No. Req'd = 20

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DATA SHEET 4.3.7-1
OPERABILITY CHECKS
AUTOMATIC TESTS

TS 32015-074

6a

Rev B

ATTACH TO DATA SHEET 4.3.7-1 OPERABILITY CHECKS - - - AUTOMATIC CHECKS
BYC - - -

attach to data sheet 4.3.7-1 operability check, 2; tape HT-FN, CRK0, file 2, rev 121880

OPERABILITY CHECK
AUTOMATIC CHECK

SMA Designation: F-1 ACCEPT TEST operation: SNE(1) BUMPER
Serial Number: 4 Test Flow Event: G-3
Run Number: 12181.1154 Sequence Number: 1

TEMPERATURES T1 T2 T3 T4 T5 T6 T7 T8 T9
(+2) (-2) (+X) (-X) (BRNG) (SAR) (SME) (-2-X) (+2-X)
deg C 26.1 24.7 25.2 25.6 25.3 26.5 29.2 24.1 24.1

SMA POWER SUPPLIES measured supply rms measured spec P/F
HOM volts WATTS WATTS
+27 28.9 28 to 30 29.0 200 P
-27 -28.8 -28 to -30 -27.2 200 P
-6.3 6.3 to 7.7 2075.2 2500 P

LEVEL DIGITAL SNE(1) ON SNE(2) ON SNE(1)/BUMPER(2)
ELEMETRY, volts 4.4 0.5 0.2

MODE SNE(1), BUMPER

PRESSURE, torr 0.6 req'd ≤ 2 P

ROQUE PULSES, usec mean sigma req'd
(100 scans) TAU A 872.9 0.7 ---
TAU B 967.2 0.6 ---

BUMPER-BUMPER TIME, usec combined req'd sigma req'd
(100 scans) mean 71342.2
71342.9 to 71343.8 0.7 2.9 P P

TURN-ON TIME, sec 8.9 spec ≤ 60 P
(time to reach within 10usec of active scan time)

Tested by

QA Stamp

NO. 2800

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1000 11 11 1154

4-1 1154-7 TEST

4-1 1154-7 TEST

1215.1154

5-1 1154-7 TEST

5-1 1154-7 TEST

BUMPER MODE operation

Scan N: 99 no. of words transferred = 32

Line Length: N-1: 005 306 325 000

Bumper to Bumper Time: N-1: 71343.7

Final Time: N: 60743.11

TELEMETRY

Byte No.	Name	Contents	Pulses	Time(used)
1	SYNC	200		
2	OPSTAT N	046	Bit 7 = 0: Scan N= Forward	
3	SCHLIN N	130	88	16.58
4	TRNERR N	000 000	0	0.00
5	TORPLS N	355 010	-4600	-866.87
6	SHSERR N-1	000 000	0	0.00
7	PHSERR N-1	000 000	0	0.00
8	SUMERR N-1	377 356 013	-4597	-866.31
9	SCHCTR	003 146		
10	SCHLIN N-1	250	-88	-16.58
11	TRNERR N-1	000 000	0	0.00
12	TORPLS N-1	355 355	-4627	-871.96
13	SHSERR N-2	000 000	0	0.00
14	PHSERR N-2	000 000	0	0.00
15	SUMERR N-2	377 355 352	-4630	-872.53
16	SCHTYN N-2	004 353 024	322324	60742.07
17	NSCANS	037	No.Scans =	31 (decimal)

Scan N: 100 no. of words transferred = 31

Line Length: N-1: 005 306 332 377

Bumper to Bumper Time: N-1: 71344.7

Final Time: N: 60743.11

TELEMETRY

Byte No.	Name	Contents	Pulses	Time(used)
1	SYNC	200		
2	OPSTAT N	246	Bit 7 = 1: Scan N= Reverse	
3	SCHLIN N	250	-88	-16.58
4	TRNERR N	000 000	0	0.00
5	TORPLS N	355 340	-4640	-874.41
6	SHSERR N-1	000 000	0	0.00
7	PHSERR N-1	000 000	0	0.00
8	SUMERR N-1	377 355 350	-4632	-872.90
9	SCHCTR	003 146		
10	SCHLIN N-1	130	88	16.58
11	TRNERR N-1	000 000	0	0.00
12	TORPLS N-1	355 010	-4600	-866.87
13	SHSERR N-2	000 000	0	0.00
14	PHSERR N-2	000 000	0	0.00
15	SUMERR N-2	377 356 013	-4597	-866.31
16	SCHTYN N-2	004 353 035	322333	60743.77
17	NSCANS	037	No.Scans =	31 (decimal)

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TS 32015-0044
Rev. B

DATA SHEET 4.3.7-2: OPERABILITY CHECKS

Manual Tests

SMA Designation F-1 S/N 4 SME(1) (M) ✓ SME(2) (M)

Step

Bmpr

(a)

MUX Pulse Interfaces

Place check in blocks indicated after observing the waveform (see Figure 4.3-12). The signal low should be 40 ± 40 m volts, and the signal high should be 660 ± 40 mV. The pulse duration should be from 300 μ sec to 400 μ sec. (For Pseudo SAMS just confirm their presence with a check)

SIGNAL	SWITCH POSITION	NORM	SWITCH POSITION	COMPLEMENT	PSEUDO (48 μ sec)
Pulses	3 or 7	✓	4 or 8	✓	✓
Direction	1 or 5	✓	2 or 6	✓	✓

(b)

"SME 1 ON MUX":

IF SME (1) is ON (M)

IF SME (2) is ON (M)

Logic 1

4.5 to 5.5 volts ✓

Logic 0

0 to 0.8 volt Pass Fail

Date 1/9/81 QA Stamp



Test Flow Event G

Tested by FB

Comments

No. Req'd = 20

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DATA SHEET 4.3.7-1
OPERABILITY CHECKS
AUTOMATIC TESTS

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Rev B

ATTACH TO DATA SHEET 4.3.7-1 OPERABILITY CHECKS - AUTOMATIC CHECKS

attach to data sheet 4.3.7-1 operability check, 210401-10, file 2, rev 1218

OPERABILITY CHECK
AUTOMATIC CHECK

SMA Designation: F-1 ACCEPT TEST
Serial Number: 4
Run Number: 12181.1200

operation: SME(2) SAM
Test Flow Event: G-5
Sequence Number: 1

TEMPERATURES	T1	T2	T3	T4	T5	T6	T7	T8	T9
	(+2)	(-2)	(+X)	(-X)	(BRDG)	(SAM)	(SME)	(-2-X)	(+2-X)
deg C	26.1	24.7	25.2	25.6	25.4	26.5	29.2	24.1	24.1

SMA POWER SUPPLIES	measured	supply rms	measured	spec	P/F
	NOM	volts	mamps	mamps	
+27	28.9	28 to 30	27.4	200	P
-27	-28.8	-28 to -30	26.2	200	P
-6.8	6.8	6.3 to 7.7	2221.6	2500	P

BILEVEL DIGITAL
TELEMETRY, volts

SME(1) ON	SME(2) ON	SAM(1)/BUMPER(2)
0.5	4.4	0.2

MODE

SME(2), SAM
0.6

PRESSURE, torr

req'd	= 2
0.6	

TORQUE PULSES, usec
(100 scans) TAU A

mean	sigma	req'd
800.7	0.4	600 to 1000
755.2	0.4	600 to 1000

ACTIVE SCAN TIME, usec
(100 scans)

combined	mean	req'd	sigma	req'd
60742.9	60742.8	0.4	2.9	
to 60743.2				

TURN-ON TIME, sec
time to reach within 10usec of active scan time

8.2	spec	= 60

Tested by

B

QA Stamp

TEST

NO. 2200-11

Date: 01/01/01 Date Time: 1200

Experiment: F-1 ACCEPT TEST
Serial Number: 1
Run Number: 12131.1200
Test Flow Event: 0
Sequence Number: 1



SCAN MODE operation

scan N: 99. no. of words transferred = 32

Line Length: N-1: 376 200 031 000
Active Scan Time: N-1: 60742.81
Final Time: N: 60743.30

TELEMETRY

Byte No	Name	Contents	Pulses	Time(uscd)
1	SYNC	246		
2	OPSTAT N	106	Bit 7 = 0: Scan N= Forward	
3	SONLIN N	130	88	16.58
4	5 TRNERR N	002 335	733	138.13
6	7 TORPLS N	360 132	-4006	-754.93
8	9 SHSERR N-1	377 350	-24	-4.52
10	11 FHSERR N-1	000 031	25	4.71
12	13 14 SUMERR N-1	377 360 132	-4006	-754.93
15	16 SONCTR	003 337		
17	SONLIN N-1	250	-88	-16.58
18	19 TRNERR N-1	002 151	617	116.27
20	21 TOPPLS N-1	357 152	-4246	-800.16
22	23 SHSERR N-2	000 044	36	6.78
24	25 FHSERR N-2	377 340	-32	-6.03
26	27 28 SUMERR N-2	377 357 147	-4249	-800.73
29	30 31 SONCTM N-2	004 353 025	322325	60742.26
32	NSCANS	037	No.Scans =	31 (decimal)

B- 12581

10603

scan N: 100 no. of words transferred = 31

Line Length: N-1: 002 057 336 377
Active Scan Time: N-1: 60743.00
Final Time: N: 60743.67

TELEMETRY

Byte No	Name	Contents	Pulses	Time(uscd)
1	SYNC	246		
2	OPSTAT N	306	Bit 7 = 1: Scan N= Reverse	
3	SONLIN N	250	-88	-16.58
4	5 TRNERR N	002 152	618	116.46
6	7 TORPLS N	357 147	-4249	-800.73
8	9 SHSERR N-1	000 042	34	6.41
10	11 FHSERR N-1	377 336	-34	-6.41
12	13 14 SUMERR N-1	377 357 147	-4249	-800.73
15	16 SONCTR	003 340		
17	SONLIN N-1	130	88	16.58
18	19 TRNERR N-1	002 335	733	138.13
20	21 TORPLS N-1	360 132	-4006	-754.93
22	23 SHSERR N-2	377 350	-24	-4.52
24	25 FHSERR N-2	000 031	25	4.71
26	27 28 SUMERR N-2	377 360 132	-4006	-754.93
29	30 31 SONCTM N-2	004 353 030	322328	60742.82
32	NSCANS	037	No.Scans =	31 (decimal)

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EW.B

DATA SHEET 4.3.7-2: OPERABILITY CHECKS

Manual Tests

SMA Designation F-1 S/N 4 SHE(1) (M) SHE(2) (M) ✓

Step

(a)

MUX Pulse Interfaces

Place check in blocks indicated after observing the waveform (see Figure 4.3-12). The signal low should be 40 ± 40 m volts, and the signal high should be 680 ± 40 mv. The pulse duration should be from 300 μ sec to 400 μ sec. (For Pseudo SAMS just confirm their presence with a check)

SIGNAL	SWITCH POSITION	NORM	SWITCH POSITION	COMPLEMENT	PSEUDO (45 μ sec) ^(M)
Pulses	3 or 7	✓	4 or 6	✓	✓
Direction	1 or 5	✓	2 or 6	✓	✓

(b)

"SHE 1 ON MUX":

IF SHE (1) is ON (✓)

IF SHE (2) is ON (✓)

Logic 1

4.5 to 5.5 volts

Logic 0

0 to 0.8 volt ✓ Pass ✓ Fail

Date 1/20/81

QA Stamp



Test Flow Event

Tested by

Comments

No. Req'd = 20

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DATA SHEET 4.3.7-1
OPERABILITY CHECKS
AUTOMATIC TESTS

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ATTACH TO DATA SHEET 4.3.7-1 OPERABILITY CHECKS - AUTOMATIC CHECKS

attach to data sheet 4.3.7-1 operability check, 2; attach F-H, trk 0, file 2, rev 121880

OPERABILITY CHECK
AUTOMATIC CHECK

SMA Designation: F-1 ACCEPT TEST
Serial Number: 4
Run Number: 12181.1315
Operation: SNE(2) BUMPER
Test Flow Event: G-7
Sequence Number: 1

TEMPERATURES
deg C

T1	T2	T3	T4	T5	T6	T7	T8	T9
(+Z)	(-Z)	(+X)	(-X)	(BRDG)	(SAM)	(SNE)	(-2-X)	(+2+X)
26.3	24.8	25.4	25.8	25.8	27.0	30.3	24.2	24.2

SMA POWER SUPPLIES

measured	supply rms	measured	spec	P/F
WOM	volts	WOMPS	WOMPS	
+27	28 to 30	28.1	200	P
-27	-28 to -30	27.1	200	P
-6.8	6.3 to 7.7	2399.6	2500	P

BILEVEL DIGITAL
TELEMETRY, volts

SME(1) ON	SME(2) ON	SAM(1)/BUMPER(2)
0.3	4.4	3.9

MODE
SME(2), BUMPER

PRESSURE, torr

1.3	rea'd	<= 2

TORQUE PULSES, usec
(100 scans) THU A
THU B

mean	sigma	rea'd
842.4	0.7	---
901.9	0.8	---

BUMPER-BUMPER TIME, usec combined
(100 scans)

mean	sigma	rea'd
71342.9	0.7	2.9
to 71343.8		

TURN-ON TIME, sec
(time to reach within 10usec of active scan time)

7.9	spec	<= 60

Tested by

QA Stamp

Doc. A Date: 012101 Data Time: 1315

SME Designation: F-1 ROCKET TEST
 Lot Number: 4
 L Number: 12181.1315
 Test Flow Event: G
 Sequence Number: 1

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BUMPER MODE operation

scan N: 99 no. of words transferred = 32

Line Length, N-1: 005 306 317 000
 Bumper to Bumper Time, N-1: 71342.6
 Final Time, N: 60743.11

TELEMETRY

Byte No	Name	Contents	Pulses	Time(μsec)
1	SYNC	246		
2	OPSTAT N	146		
3	SONLIN N	130	88	16.58
4	TRNERR N	000 000	0	0.00
5	TORPLS N	355 115	-4787	-902.11
6	SHSERR N-1	000 000	0	0.00
7	FHSERR N-1	000 000	0	0.00
8	SUMERR N-1	377 355 114	-4788	-902.30
9	SONCTR	003 150		
10	SONLIN N-1	250	-88	-16.58
11	TRNERR N-1	000 000	0	0.00
12	TORPLS N-1	356 215	-4467	-841.81
13	SHSERR N-2	000 000	0	0.00
14	FHSERR N-2	000 000	0	0.00
15	SUMERR N-2	377 356 215	-4467	-841.81
16	SONCTY N-2	004 353 031	322329	60743.01
17	NSCANS	037	No.Scans =	31 (decimal)

scan N: 100 no. of words transferred = 31

Line Length, N-1: 005 306 316 377
 Bumper to Bumper Time, N-1: 71342.4
 Final Time, N: 60743.11

TELEMETRY

Byte No	Name	Contents	Pulses	Time(μsec)
1	SYNC	246		
2	OPSTAT N	346		
3	SONLIN N	250	-88	-16.58
4	TRNERR N	000 000	0	0.00
5	TORPLS N	356 217	-4465	-841.43
6	SHSERR N-1	000 000	0	0.00
7	FHSERR N-1	000 000	0	0.00
8	SUMERR N-1	377 356 216	-4466	-841.62
9	SONCTR	003 150		
10	SONLIN N-1	130	88	16.58
11	TRNERR N-1	000 000	0	0.00
12	TORPLS N-1	355 115	-4787	-902.11
13	SHSERR N-2	000 000	0	0.00
14	FHSERR N-2	000 000	0	0.00
15	SUMERR N-2	377 355 114	-4788	-902.30
16	SONCTY N-2	004 353 037	322327	60742.64
17	NSCANS	037	No.Scans =	31 (decimal)

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TS 32015-004
Rev. B

DATA SHEET 4.3.7-2: OPERABILITY CHECKS

Manual Tests

SMA Designation F-1 S/N 4 SME(1) (b) SME(2) (b) ✓

Step

Bmpr

(a)

MUX Pulse Interfaces

Place check in blocks indicated after observing the waveform (see Figure 4.3-12). The signal low should be 40 ± 40 m volts, and the signal high should be 680 ± 40 mV. The pulse duration should be from 300 μ sec to 400 μ sec. (For Pseudo SAMS just confirm their presence with a check)

SIGNAL	SWITCH POSITION	NORM	SWITCH POSITION	COMPLEMENT	PSEUDO (48 μ sec)
Pulses	3 or 7	✓	4 or 8	✓	✓
Direction	1 or 5	✓	2 or 6	✓	✓

(b)

"SME 1 ON MUX":

IF SME (1) is ON (✓)

IF SME (2) is ON (✓)

Logic 1

4.5 to 5.5 volts

Logic 0

0 to 0.8 volt ✓ Pass ✓ Fail

Date 1/20/81 QA Stamp



Test Flow Event

G

Tested by

B

Comments

No. Req'd = 20

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Appendix B

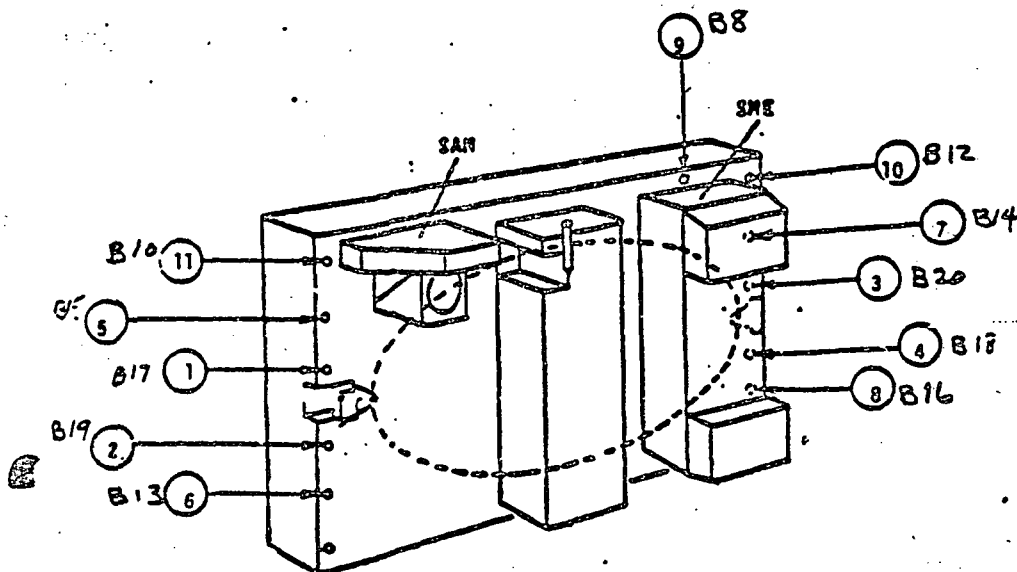
Scan Mirror Assembly Acceptance Test Data

Test Flow Event Q

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SMA INSTALLATION-REMOVAL CONFIGURATION



NOTE: Torque SMA to TDS fixture
using 30 ± 2 in-lbs. Use
only bolts indicated.

Order Of Torquing	Bolt # As Defined At SBRC
1 ....	.... B 17
2 ....	.... B 19
3 ....	.... B 20
4 ....	.... B 18
5 ....	.... B 15
6 ....	.... B 13
7 ....	.... B 14
8 ....	.... B 16
9 ....	.... B 8
10 ..	.... B 12
11 ..	.... B 10

FIGURE 4.3.3.2-1A

PRECEDING PAGE BLANK NOT FILMED

DATA SHEET 4.3.0 - 4

SMA INSTALLATION AND REMOVAL FROM THE OTS INTERFACE

INSTALLATION

Initial (PRE-H)

Bolt # 17 QA
19
20
18
15
13
14
16
8
12
10

DE-INSTALLATION

Post-Vibration (PRE-K)

Bolt # 17 QA
19
20
18
15
13
14
16
8
12
10



DATE: 2-27-81 15:00

Installation/Removal of SMA was executed by: RAY ALLEY

INSTRUMENTATION (RE)

DATE: 10105 3-3-81



NOTE:

SHIMS ARE LOCATED @ BOLT #10 0.003"

TOOLS WRENCH F516491

CALIB. DUE 5/15/81

MICROMETER

F 521468

CALIB. DUE 5/13/81

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DATA SHEET 4.3.4-1
SCAN PROFILES
ALONG SCAN

TS 32015-004
8 March 1980

SMA Designation F-1 ACCEPT TEST
T1 T2 T3 T4 T5 T6 T7 T8 T9
25.9 24.9 25.2 25.6 25.4 26.9 28.4 24.3 24.4

SAM ANGLES
USED (MRAD) 57.171 57.159

IPAR COUNTS K - 0.523185

BUMPER A 3548

P2 P3 328481

MID P1 P4 184238

P0 P6 2

BUMPER B 3129

OFFSET-CORRECTED SCAN ANGLES (REF P0, μ RAD):

P2 134328

P1 67174

P0 8

P3 134329

P4 67171

P6 8

NEXT P0 8

FAST SCAN

328488 328493

184249 184241

8

SAN MODE

S/N 4

SME (1) or (2) 1

28.9-28.8 0.7

(Nominal Voltages)

SMOOTHING POLYNOMIAL COEFFICIENTS

ORDER (T)	FWD	REV	SPEC	P/P
0	1.7317e-07	-8.9883e-08		
1	2.1243e-03	2.7658e-03		
2	2.3388e-01	-3.1633e-01		
3	1.0574e-01	1.3329e-01		
4	2.8306e-02	-2.3746e-02		
5	1.2024e-03	1.5204e-03		
INFLECTION POINTS	3	3	G	P
MAX+ MAX-	8.4 -8.4	7.4 -7.4	17.8	P
AVERAGED TO SMOOTHED	0.2	0.2	<2.1 SPEC	P

7.00e-01 TORR PRESSURE

0 MICRO RADIANS

MIDSCAN PRESSURE CORRECTION 0.55 μ RAD

SAN OFFSET, μ rad

22.12 1.0 -1.2
5.4 2.1 -0.8
25.29 2.9 -0.8

NON-LINEARITY, μ RAD

17.0 SPEC

10

-10

-17.5 SPEC

-20

Run No. 22781.1546

Test Flow Event H-2 629 6

Comments

QA Stamp

Tested By

Date 2781

data for smoothed profile: N/A
data for measured profile: N/A

FWD SMOOTHED
REV SMOOTHED
FWD MEASURED
REV MEASURED

NO. REQ'D = 2
VELLUM

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DATA SHEET 4.3.4-2
SCAN PROFILES
ALONG SCAN SMOOTHED

TS 32015-004
8 March 1980

SMA Designation F-1 ACCEPT TEST

SAW MODE S/N 4

SME (1) or (2) 1
(Nominal Voltages)

K = 0.500105
FWD MIDSCAN
REV MIDSCAN
NESTED, MIDSCAN:
NON-NESTED, MIDSCAN

-5.64
-1.71
-2.48
-1.18

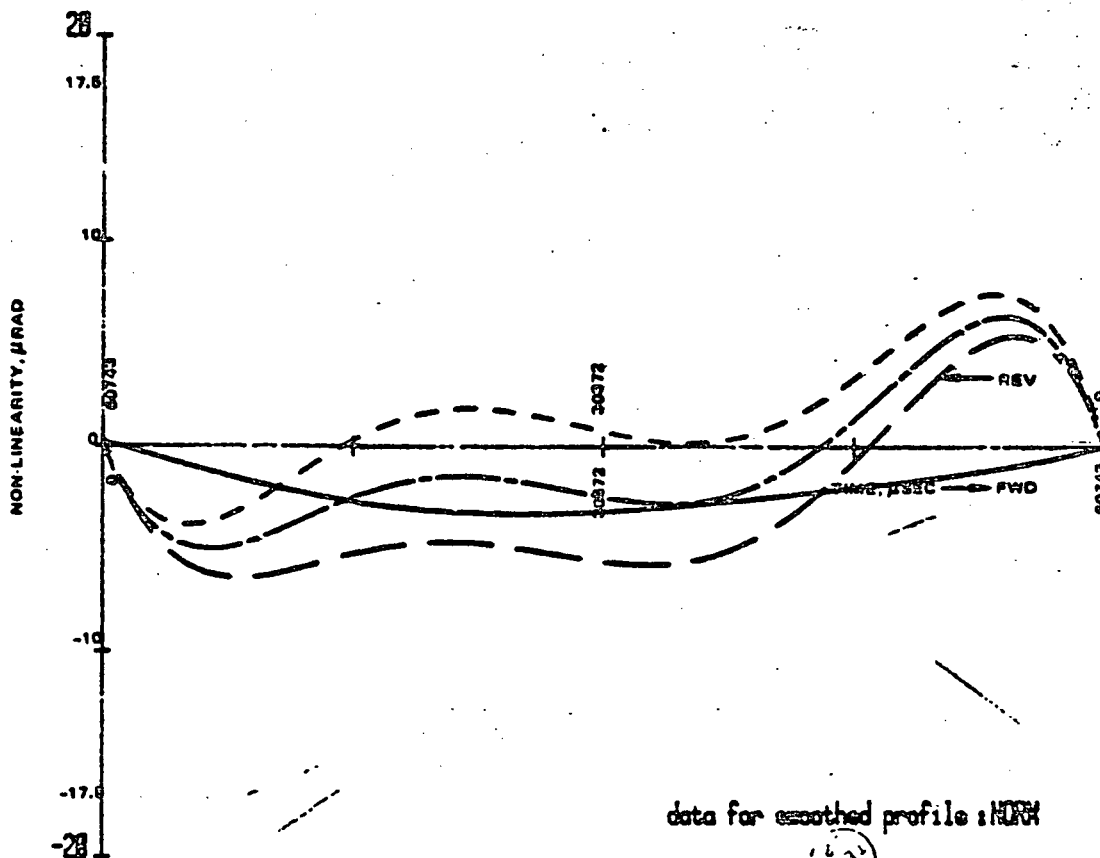
Free SMOOTHED PROFILES

28.9 -28.8 6.7

PERIOD
1st HALF
2nd HALF
PHI_L
PHI_F, PHI_R

	FWD	REV
PERIOD	00742.81	00741.87
1st HALF	T1 30378.87	T3 30368.20
2nd HALF	T2 30365.95	T4 30373.87
PHI _L	-8.22	-8.21
PHI _F , PHI _R	-8.57	8.14

--- FWD SMOOTHED
--- REV SMOOTHED
--- NESTED, SMOOTHED
--- NON-NESTED SMOOTHED



data for smoothed profile: NORM

Run No. 22781.1546

QA Stamp

Date 22781

Test Flow-Event H-2 seq 8

Tested By

Comments test no. 2 1 FWD/1 REV SCAN, 402 pts each

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DATA SHEET 4.3 4-3
SCAN PROFILES
BAND TO BAND REGISTRATION

TS 32015-004
8 March 1980

SMA Designation F-1 ACCEPT TEST

SAN WIDE

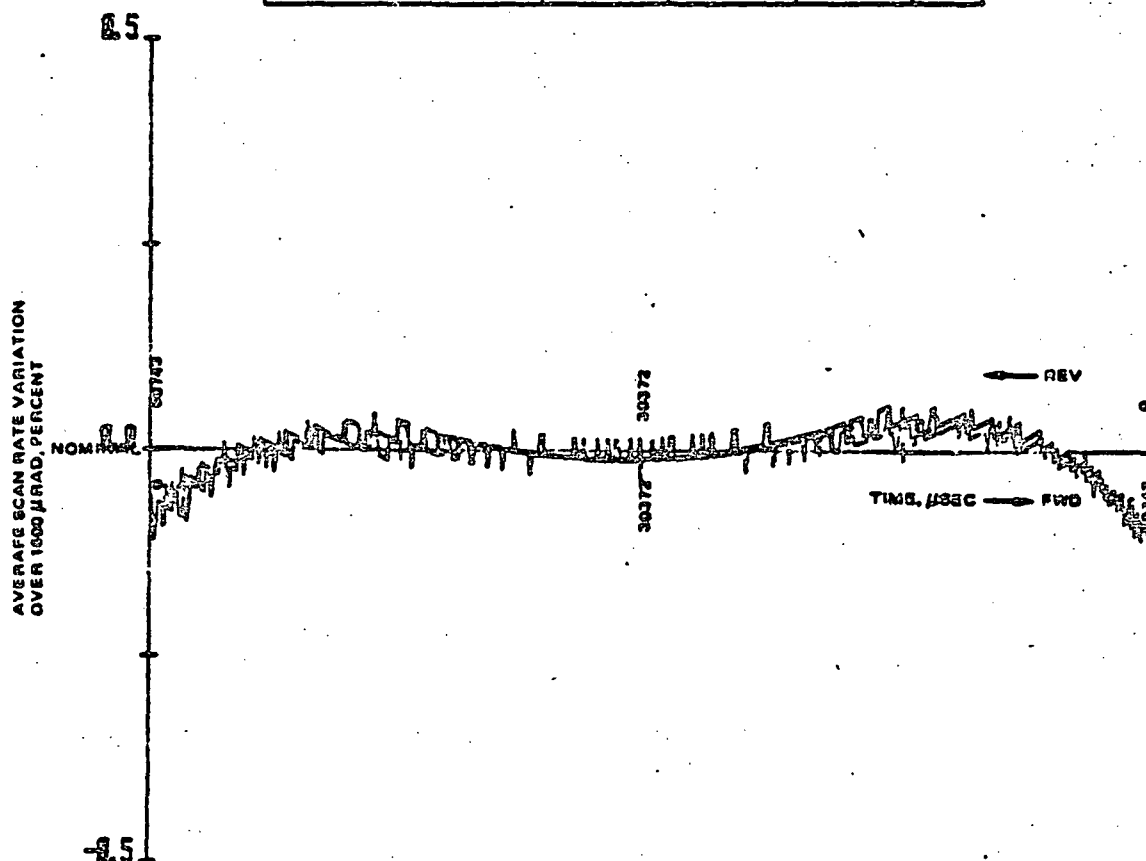
S/N 4

SME (1) or (2) 1
(Nominal Voltages)

BAND SEPARATION = 75.8 IFV (1678.2 μ RAD) 28.9 - 28.8 0.7

	PWD	REV	SPBC	P/P
PEAK AVG SCAN RATE	0.109	0.113	XXXX	XXXX
AVG SCAN RATE (100% OF SCAN) LESS THAN:	0.051	0.039	← .094%	P

FWD _____
REV _____



data used for computations = RAW

Run No. 22781.1548

Test Flow Event H-2 seq 6.0000

Comments test no. 2

QA Stamp

Date 2/27/81

Tested By

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TS 32015-004
8 March 1980

DATA SHEET 4.3.4.4
SCAN PROFILES
CROSS SCAN
SAW MODE

SMA Designation F-1 ACCEPT TEST

S/N 4

SME (1) or (2) 1 28.9-28.8 8.7
(Nominal Voltages)

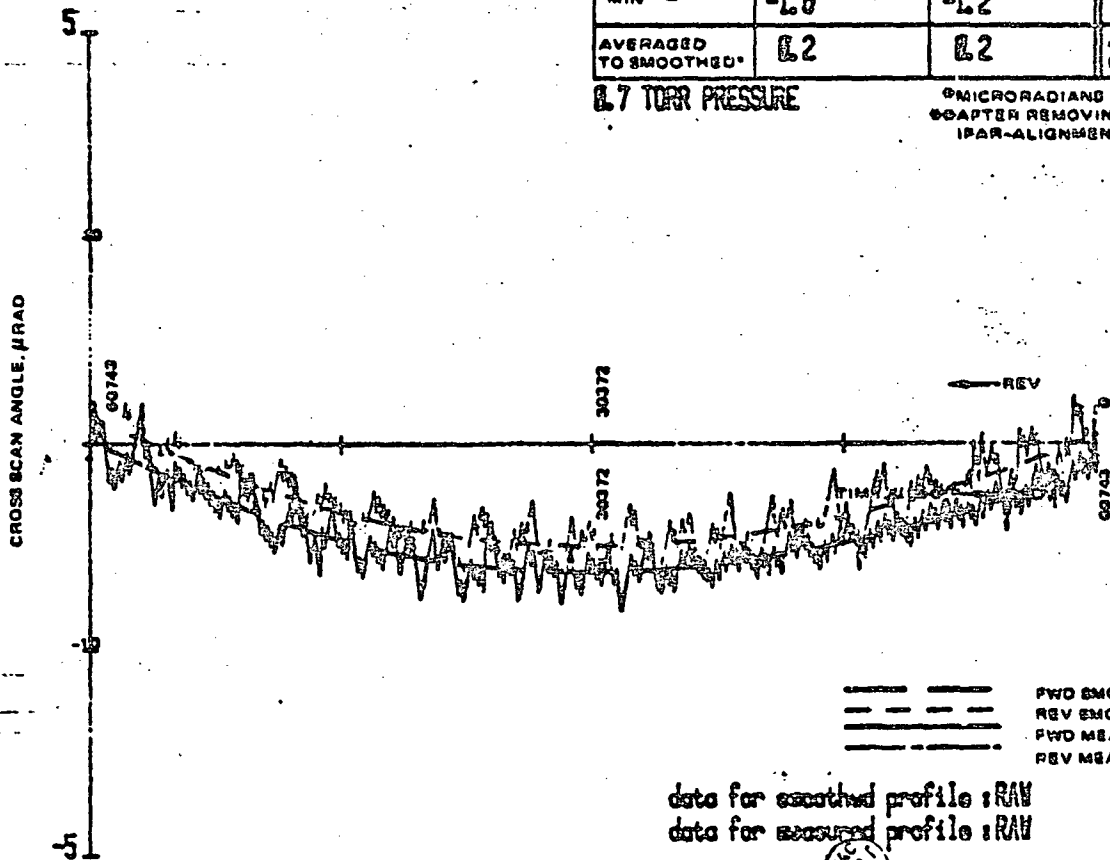
FORWARD LINEAR TERM
REMOVED TO CORRECT FOR
IPAR ALIGNMENT (REV TERM
- FWD TERM): 96.93 wrod

SMOOTHING POLYNOMIAL COEFFICIENTS

ORDER (TI)	FWD	REV	SPEC	P/P
0	3.6531e-08	9.2305e-08		
1	-9.8578e-05	-8.2751e-05		
2	5.0357e-04	1.1553e-03		
3	9.4718e-02	-8.6354e-04		
4	-1.2774e-03	2.2216e-01		
5	8.1589e-03	-2.2708e-03		
INPLECTION POINTS	8	8		P
MAX - MIN -	8.8 -1.8	8.3 -1.2		P
AVERAGED TO SMOOTHED	8.2	8.2	42.0 RMT	P

8.7 TORR PRESSURE

0 MICRORADIANS
0 ADAPTER REMOVING LINEAR
IPAR-ALIGNMENT TERM



data for smoothed profile : RAW
data for measured profile : RAW

Run No. 22781.1548

Test Flow Event 4-2

Comments test no. 2

QA Stamp

Tested By

Date 22781

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TS 32015-004
8 March 1980

DATA SHEET 4.3.4-5
SCAN PROFILES
CROSS SCAN
SAW NOISE
S/N 4

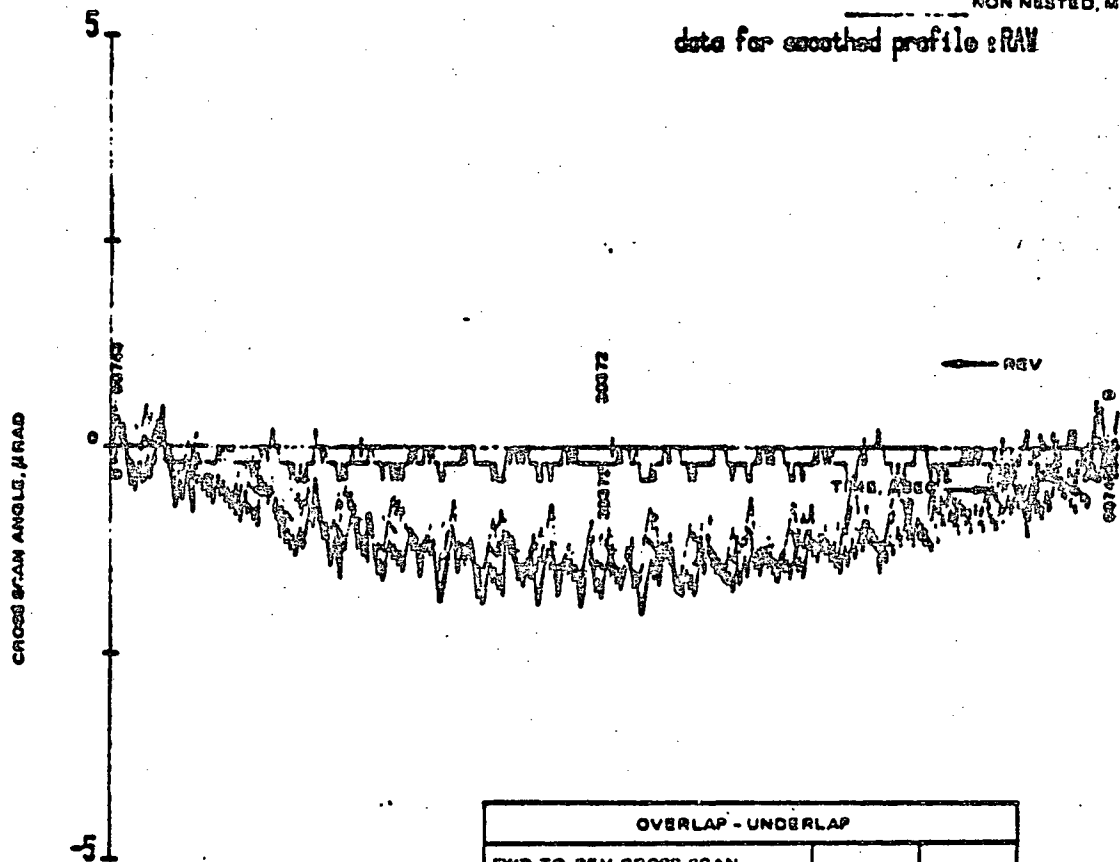
SMA Designation F-1 ACCEPT TEST

SME (1) or (2) 1
(Nominal Voltages)
28.9 - 28.8 6.7

50225 26

===== FWD MEASURED
===== REV MEASURED
===== NESTED, MEASURED
===== NON NESTED, MEASURED

data for smoothed profile : RAW



OVERLAP - UNDERLAP		
FWD TO REV CROSS SCAN PROFILE (2X NON-NESTED), μRAD	SPQC	P/P
|MAX| - 8.82	<2.1 μRAD	P

Run No. 22781.1548

Test Flow Event H-2 8

Comments test no. 2

QA Stamp _____ Date 22781

Tested By _____

TELETYPE - TELETYPE UNIT - F-trk0-file16-rev22381

TELETYPE UNIT - F-trk0-file15-rev22381

Date: 022781 Time: 1546

SRM Designation: F-1 ACCEPT TEST
Serial Number: 4
Run Number: 22781.1546
Test Flow Event: H
Test Number: 2
Sequence Number: 6

data tape identifier: F1D6
track for data: 0
INIT. CAL data file number: 1
SCRM data file number: 2
NORM AVG SCRM data file number: 3
Smoothing Coeffs file number: 4

mode selected: NORM

TELEMETRY PRINTOUT, 2: tapeAT-F-trk0-file16-rev22381

Data Date: 022781 Data Time: 1546

SAM MODE operation

scan N: 1 no. of words transferred = 837

de Length N-1: 377 008 015 000
active Scan Time N-1: 60743.57
Final Time N: 60743.11

TELEMETRY

Scan No	Name	Contents	Pulses	Time(used)
1	SYND	006		
2	OPSTAT N	006		
3	SCHLIN N	130	88	16.58
4	5 TRNERR N	003 374	1020	192.22
6	7 TORPLS N	360 165	-3979	-749.84
8	9 SHSERR N-1	377 360	-16	-3.02
10	11 FHSERR N-1	000 015	13	2.45
12	13 14 SUMERR N-1	377 360 170	-3976	-749.28
15	16 SCHCTR	000 113		
17	SCHLIN N-1	250	-88	-16.58
18	19 TRNERR N-1	001 033	283	53.33
20	21 TORPLS N-1	357 317	-4145	-781.13
22	23 SHSERR N-2	000 032	26	4.90
24	25 FHSERR N-2	377 340	-32	-6.03
26	27 28 SUMERR N-2	377 357 324	-4140	-780.18
29	30 31 SCHTYM N-2	004 353 037	322335	60744.14
32	NSCANS	107	No.Scans =	71 (decimal)

scan N: 2 no. of words transferred = 832

de Length N-1: 001 357 343 377
active Scan Time N-1: 60742.81
Final Time N: 60742.16

[illegible]

=====TEST INITIAL CONDITIONS=====

- (1) Fans must be off for at least 20 min.
- (2) Both Lasers must be on at least 45 min
- (3) DTS temp (+2-X) must be +/-1 deg from (-2-X)
- (4) Chamber pressure must be less than 2 torr
- (5) Laser temp polarity correct

Temperatures and Voltages

Ch	Scanner Out	Device	Cal	Measurement
4	2.0162E 00	SMA-2	1	24.819 Deg C
12	9.0800E 00	MF(-2-X)	3	24.350 Deg C
11	9.8765E 00	MF(+2-X)	3	24.379 Deg C

Date: 031781 Time: 1546

SMA Design: F-1 ACCEPT TEST
Serial Number: 4
Run Number: 22781.1546
Test File Name: H
Test Number: 12
Save Name: E
Pressure: 0.00E 00 TORR

INITIALIZE Words Transferred: 4

Word Number 0: INTERRUPT (Raw 177771 Octal)

Bit	Description	Setting
0	Panel Mode	1
1	Calibrate Mode	0
2	Scan Mode	0

Word Number 1: PANEL STATUS (Raw 042402 Octal)

Bit	Description	Setting
0	Scanner SW On	0
1	See SAM P0/P3	1
2	See SAM P2/P5	0
3	See SAM PA/PE	0
4	Processed SAM	1
5	Raw SAM	0
6	SAM 1 or SAM 2	0
7	SAM 3 (CAL SAM)	0
8	Single Reset	0
9	End SAM P0/P3	0
10	End SAM P2/P5	1
11	End SAM PA/PE	0
12	Ext. Reset	1
13	5 Facet	0
14	Calibrate Mode	0
15	Scan Mode	0
16	Initialize Mode	1
17	Slow Telemetry Mode	0

Word Numbers 2 and 3: (Raw 177633 057774 Octal)

Scan Count Preset:	7774 Octal	No. of Scans:	0
Time Count Preset:	377455	No. of Low Bits:	400

Dimension of 11 mm: 1200
 Dimension of 11 mm: 401
 Dimension of 11 mm: 5018
 6

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CALIBRATION: 947.50E: 1

Along: Cross: A-Octal-B
 947.40
 947.40

Along: Cross: A-Octal-B
 947.83
 947.83

Along: Cross: A-Octal-B
 948.17
 948.17

Along: Cross: A-Octal-B
 948.58
 948.58

Along: Cross: A-Octal-B
 948.80
 948.80

Along: Cross: A-Octal-B
 949.40
 949.40

Along Scan Calibration
 Time at end of Cal: 1549.24

Factor	IFAR Counts	Preset Angles	No. of b
P0F5	0.72 -0.44	-6.7170900E-02	1.6423383E 05
P1F4	114333.83 115.29	0.0000000E 00	2.4465494E 06
P2P3	328398.92 236.11	6.7159200E-02	1.7500396E 04

K = 0.500104
 Bumper A: 331937.89
 Bumper B: -3134.22

CROSS: SCAN conversion factor: 0.408 rad/IFAR count
 CROSS: AXIS THERM DRIET RATE: 0.09 rad/min
 CROSS: SCAN

2ND CALIB DATA
 REMOVED FOR
 100 MS 2.26-2048
 797
 LIN. TERNARY
 CR. AXK RSP
 OFFSET -0.51 mm

FIRST LOOK @ P.P.

	Device	Co1	Measurement
-1.0000E-04	QUARTER	3	ERROR
1.2317E-03	EU=6.8I	5	2231.900 mAmps
1.5100E-03	EU=+27I	5	30.200 mAmps
-1.3180E-03	EU=-27I	5	26.360 mAmps
2.0111E-03	SMA -Z	1	24.884 Deg C
1.9530E-03	SMA -X	1	25.617 Deg C
1.9379E-03	SMA +Z	1	25.904 Deg C
1.9863E-03	SMA +X	1	25.211 Deg C
1.9728E-03	TORQ BRDG	1	25.405 Deg C
0.4816E-02	SME TEMP	2	29.376 Deg C
1.8715E-03	SAM TEMP	1	26.856 Deg C
9.7357E-00	EU=6.8V	4	6.736 Volts
9.0814E-03	MF(-Z-X)	3	24.341 Deg C
9.0774E-03	MF(+Z+X)	3	24.372 Deg C
-1.4030E-00	SME(1)TEL	4	4.403 Volts
4.8877E-01	SME(2)TEL	4	0.489 Volts
-1.0000E-04	SME PR U7	3	ERROR
2.5404E-01	SAM1-BNP2	4	0.254 Volts
1.8891E-01	EU=+27V	4	28.891 Volts
-2.8832E-01	EU=-27V	4	-28.832 Volts

€ Data Tape Identifier: F1D6
Track for Data: 0
Inst/Cal Data File Number: 1
Scan Data File Number: 2
Norm/Avg Scan Data File Number: 3
Smoothing Coeffs File Number: 4

=====

IF 'ERROR' 48 OCCURS DURING MARKING OF TAPE:

Type a REMARK---press execute---press continue

=====

Ave 0.00 Cross 0.00 Minutes: 949.93 ← TIME, MINUTES
Sigma 0.00 0.00

-----BUMPER B-----

Ave 0.00 Cross 0.00 Minutes: 950.30
Sigma 0.00 0.00

-----PIP2-----

MIDSCAN

Ave 124204.44 Cross 112.59 Minutes: 950.57
Sigma 0.50 0.92

-----BUMPER A-----

Ave 3018+0.00 Cross 240.00 Minutes: 950.98
Sigma 0.00 0.00

-----PIP3-----

P₂ P₃

Ave 3.6400.00 Cross 236.32 Minutes: 951.45
Sigma 0.00 0.47

-----PIP5-----

FINISH LOOK
@ PIP5

Ave 2.00 Cross -0.88 Minutes: 951.98
Sigma 0.00 0.66

Along Scan Calibration
Time at end of Cal: 1551.59

Factor	IFAR Counts	Preset Angles	No. a, b
PIP5	2.00 -0.88	-6.7170900E-02	1.6423593E 05
PIP4	164235.83 111.99	0.0000000E 00	2.4465518E 06
PIP3	338400.52 236.09	6.7159200E-02	1.7993527E 04

K = 0.500105

"ENNIES" &
ANGLES

IFAR EQUATIONS
PARAMETERS

Bumper A: 331940.98
Bumper B: -3129.36

CROSS SCAN conversion factor: 0.409urad/IFAR count
CROSS AXIS THERM DRIFT RATE: 0.13urad/min
CROSS SCAN linear term removed: 96.93urad

diff in K= 0.000002

data collection: 2: tape AT-FM: tape 0: file 5: rev 22581

Time at end of SCAN: 1552.43 952.72
Time between Cal and Scan: 0.84min
CROSS AXIS DRIFT: 0.13urad/min
CRO -0.51urad

NEW
DETERMINED
FOR TEE-H (200
PRINT PAGE 45)
THEN SAME DRIFT USED
IN GENERAL SCAN

EXTRACTED TIME
AT TIME

CALIBRATION POINT OUT USING
300 SAMPLES OF IFAR COUNTS
(AVERAGE & CROSS VALUES), AND THERMAL
DRIFT CORRECTION IN CALIBRATION.

FIGURE 7

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DATA SHEET 4.3.4-1
SCAN PROFILES
ALONG SCAN

TS 32015-004
8 March 1980

SMA Designation **F-1 ACCEPT TEST**
BUMPER MODE
S/N 4
T1 T2 T3 T4 T5 T6 T7 T8 T9
26.1 24.9 25.3 25.8 25.6 27.8 29.7 24.3

SME (1) or (2) 1 28.9-28.8 6.7
(Nominal V (ggs))

SAM ANGLES USED (MRAD) -67.2 67.2
IPAR COUNTS K = 8.563123
CALIBRATION

FAST SCAN

BUMPER A
P2 P3

MID P1 P4 FROM TFEG RUN 22781.1556

P0 P5

BUMPER C

OFFSET-CORRECTED SCAN ANGLES (REF P0), μ RAD:

P2

P3

P1

P4

P0

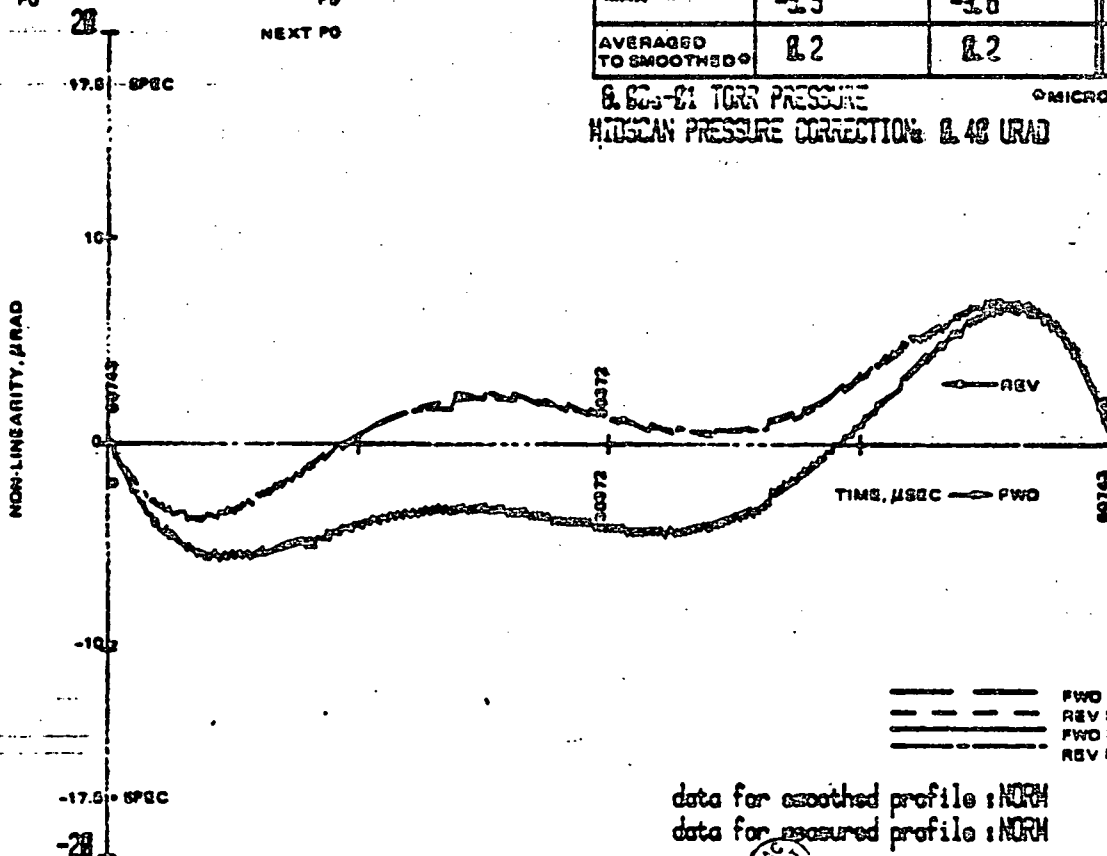
P5

NEXT P0

SMOOTHING POLYNOMIAL COEFFICIENTS				
ORDER (T)	FWD	REV	SPEC	P/P
0	1.8735e-07	5.8364e-05		
1	-1.9562e-03	2.4847e-03		
2	2.2895e-01	-2.9261e-01		
3	-1.8547e 01	1.2492e 01		
4	2.8756e 02	-2.2523e 02		
5	-1.4360e 03	1.4462e 03		
INFLECTION POINTS	3	3	<5	-
MAX+ MAX-	6.6 -5.5	6.9 -3.6	17.0	-
AVERAGED TO SMOOTHED	0.2	0.2	0.21 RMS	-

0.60-01 TORR PRESSURE
HIDSCAN PRESSURE CORRECTION: 0.40 URAD

0 MICRO RADIANS



Run No. 22781.1556

Test Flow Event H-3 seq 6

Comments test no 3

QA Stamp _____ Date 22781

Tested By _____

data for smoothed profile: NORM
data for measured profile: NORM

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TS 32015-004
8 March 1980

DATA SHEET 4.34-2
SCAN PROFILES
ALONG SCAN SMOOTHED

BUFFER NAME
S/N 4

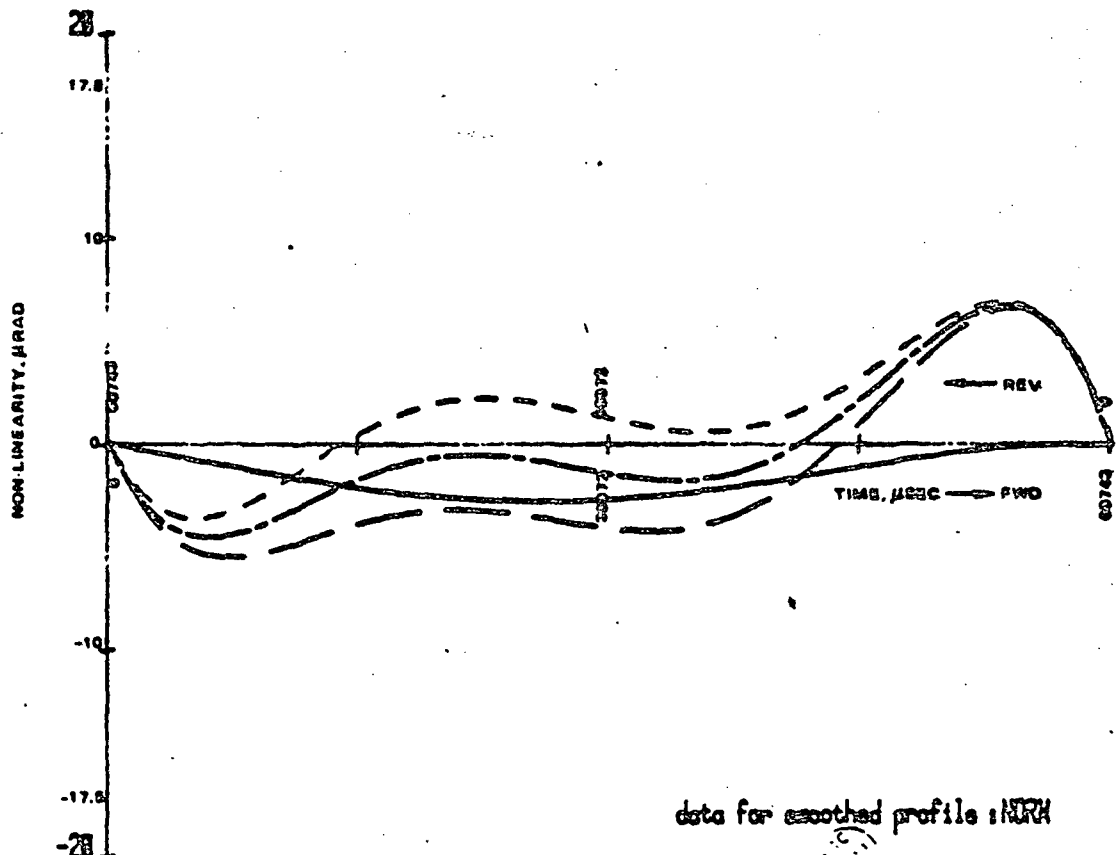
SMA Designation F-1 ACCEPT TEST

SME (1) or (2) 1
(Nominal Voltages)

28.9 - 28.8 6.7

R. JFED RAN 22781.1550
PWO MIDSCAN
REV MIDSCAN
NESTED, MIDSCAN:
NON-NESTED, MIDSCAN

==== PWO SMOOTHED
==== REV SMOOTHED
==== NESTED, SMOOTHED
==== NON-NESTED SMOOTHED



data for smoothed profile: NESTED

Run No. 22781.1550

QA Stamp _____ Date 22781

Test Flow Event H-3 seq 6

Tested By _____

Comments test no. 3

Q

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TS 32015-004
8 March 1980

DATA SHEET 4.3 4-3
SCAN PROFILES
BAND TO BAND REGISTRATION
BUFFER MODE
S/N 4

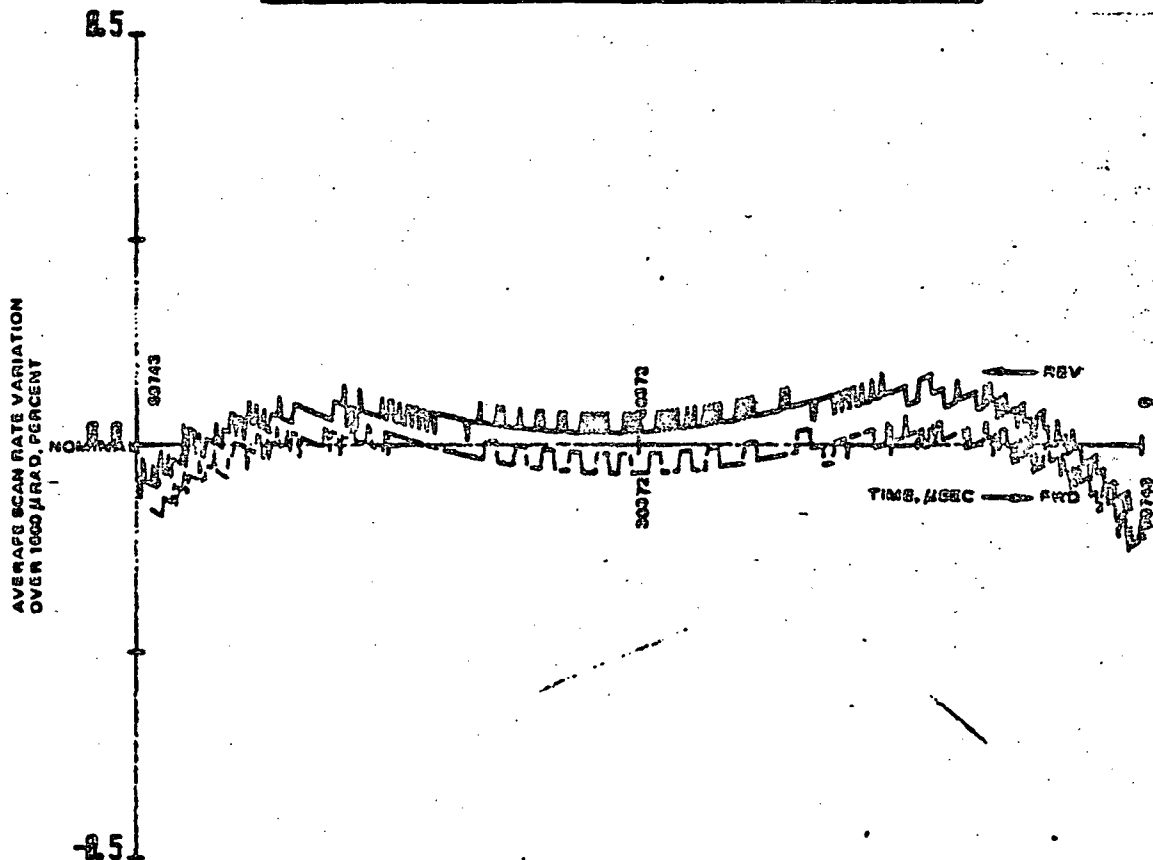
SMA Designation F-1 ACCEPT TEST

SME (1) or (2)
(Nominal Voltages)

BAND SEPARATION = 75.8 IFV (1678.2 μ RAD) 28.9 - 28.9 0.7

	FWD	REV	SEC	P/P
PEAK AVG SCAN RATE	1.125	1.127		
AVG SCAN RATE (90% OF SCAN) LESS THAN:	1.603	1.648	1.647	P

FWD
REV



data used for computations = RAW

Run No. 22701.1558

Test Flow Event H-9

Comments test no. 3

QA Stamp

Tested By



Date

2/27/81

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DATA SHEET 4.3.4.4
SCAN PROFILES
CROSS SCAN
BLU PER MODE

TS 22015-004
8 March 1980

SMA Designation **F-1 ACCEPT TEST**

S/N **4**

SME (1) or (2) **1**

28.9 - 28.8 6.7
(Nominal Voltages)

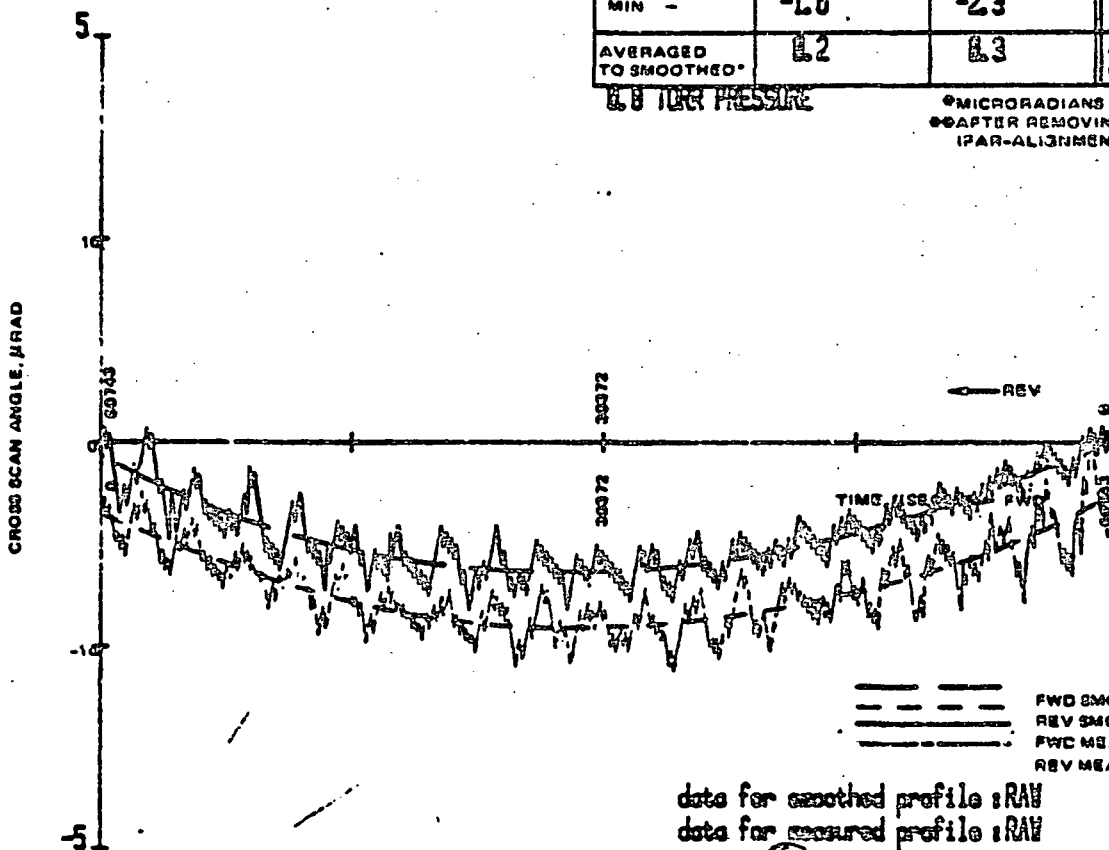
FORWARD LINEAR TERM
REMOVED TO CORRECT FOR
IPAR ALIGNMENT (SEE TERM)
- FWD TERM: **90.40 Urad**

SMOOTHING POLYNOMIAL COEFFICIENTS

ORDER (I)	FWD	REV	SPEC	P/P
0	-1.8942E-07	-5.6823E-07		
1	-1.1335E-04	-1.1887E-04		
2	2.6402E-03	3.8389E-03		
3	-1.8493E-02	-1.9238E-01		
4	1.9719E-01	1.9151E-03		
5	-7.6741E-02	-1.2535E-01		
INFLECTION POINTS	6	1		
MAX - MIN -	0.8 -1.6	-2.7 -2.3		
AVERAGED TO SMOOTHED	0.2	0.3		

0.8 TUR PRESSURE

0 MICRORADIANS
0 AFTER REMOVING LINEAR
IPAR ALIGNMENT TERM



data for smoothed profile: **RAW**
data for measured profile: **RAW**

Run No: **22781-1558**

QA Stamp

Date

22781

Test Flow Event

H-3

seq **8**

Tested By

Comments

test no. 3

NO. REC'D -:
VELLUM

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TS 32015-004
8 March 1980

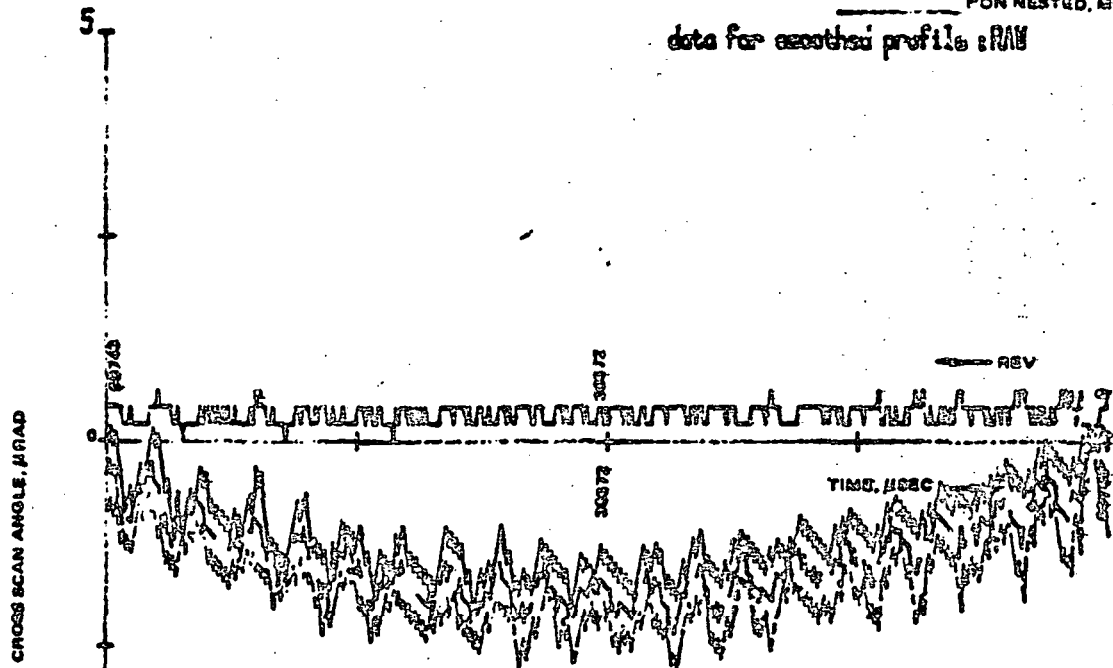
DATA SHEET 4.3.4-5
SCAN PROFILES
CROSS SCAN
BUMPER HOPE
S/N 4

SMA Designation F-1 ACCEPT TEST

SME (1) or (2) 1
(Nominal Voltages)
28.9-28.8 & 7

----- FWD MEASURED
----- REV MEASURED
----- NESTED, MEASURED
----- NON NESTED, MEASURED

data for smoothed profile: RAW



OVERLAP - UNDERLAP		
FWD TO REV CROSS SCAN PROFILE (2X NON-NESTED) μRAD	SPEC	P/P
|MAX| = 1.23	0.1 μRAD	-

Run No. 22781.1553

Test Flow-Event H-3 seq 8

Comments test no 3

QA Stamp  Date 22781

Tested By 

REPORT-PR-110-1111-1-032781

===== TEST INITIAL CONDITIONS =====

- 1. Fans must be off for at least 20 min.
- 2. Both Lissers must be on at least -5 min
- 3. DTS temp (+Z-X) must be +/-1 deg from (-Z-X)
- 4. Chamber pressure must be less than 2 torr
- 5. Cross axis polarity correct

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Temperatures and Voltages

Ch	Scanner Out	Device	Cal	Measurement
4	1.012TE 03	IMA -Z	1	24.853 Deg C
12	9.0317E 03	MFA-Z-X	0	24.353 Deg C
13	9.0777E 03	MFA+Z-X	3	24.370 Deg C

Test: 032781 Time: 1556

SKA Description: F-1 ACCEPT TEST
Serial Number: 4
Run Number: 22781.1556
Test Flow Event: H
Test Number: 3
Sequence Number: 6
Description: 0.00E 00 TORR

INITIALIZE Words Transferred: 4

Word Number 0: INTERPUPT (Raw 177771 Octal)

Bit	Description	Setting
0	Panel Mode	1
1	Calibrate Mode	0
2	Scan Mode	0

Word Number 1: PANEL STATUS (Raw 042402 Octal)

Bit	Description	Setting
0	Bumper SW On	0
1	See SAM P0/P3	1
2	See SAM P3/P5	0
3	See SAM PA/PB	0
4	Processed SAM	1
5	Raw SAM	0
6	SAM 1 or SAM 2	0
7	SAM 3 (CAL SAM)	0
8	Single Reset	0
9	End SAM P0/P3	0
10	End SAM P3/P5	1
11	End SAM PA/PB	0
12	Ext Reset	1
13	5 Facet	0
14	Calibrate Mode	0
15	Scan Mode	0
16	Initialize Mode	1
17	Slow Telemetry Mode	0

Word Numbers 2 and 3: (Raw 177633 057774 Octal)
Scan Count Preset: 7774 Octal No. of Scans: 3
Time Count Preset: 3774665 No. of Samples: 400

Number of Scans of S# Dimension: 3
Scans x Samples: 1200
Number of Samples plus 1: 401
Dimension of S# Array: 5018
Dimension of M# Array: 6

45

- ENDED -

15-11-1963

RE-CALIBRATION OF PREVIOUS MIRROR POSITION

-P 193

-BUNFER A-

- 2293

-P4F5

Time	2.96	-2.96	Minutes:	961.43
Time	0.00	0.00		

K = 0.500122

GROUP 1: 37,743.71
 GROUP 2: 11,127.73

```

00000000 SCAN linear term removed: 0.4096rad
00000000 ANIS THERM DRIFT RATE: 0.12rad/min
00000000 SCAN linear term removed: 96.46rad

```

[illegible]

data collection, 210
 HT-FM, 176
 1165, raw 22581

```
Time at end of SCAN: 1604.37 964.62
Time between Cal and Scan: 0.88min
CPROG A11: DRIFT: last PD to SCAN0: 0.11rad
CPROG A11: REFERENCE OFFSET: 0.38rad
```

Time between last and Scan: 0.95min
CROSS AXIS DRIFT: last PO to SCAN: 0.12urad
CROSS AXIS REFERENCE OFFSET: 0.35urad

Ch	Scanner Out	Device	Col	Measurement
0	-1.0000E-04	QUARTER	3	ERROR
1	0.3357E-02	EU=6.8I	5	2335.700 nAmps
2	1.4620E-03	EU=+27I	5	29.260 nAmps
3	-1.2650E-03	EU=-27I	5	25.320 nAmps
4	0.0072E-03	SNA -Z	1	24.929 Dec C
5	1.2466E-03	SNA -X	1	25.750 Dec C
6	1.4211E-03	SNA +Z	1	26.074 Dec C
7	1.5779E-03	SNA +X	1	25.331 Dec C
8	1.9033E-03	TORQ BRDG	1	25.554 Dec C
9	0.0571E-02	SME TEMP	2	29.706 Dec C
10	1.0111E-03	SAH TEMP	1	26.988 Dec C
11	6.7324E-00	EU=6.8V	4	6.732 Volts
12	9.0825E-03	MF(-Z-X)	3	24.332 Dec C
13	9.0771E-03	MF(+Z+X)	3	24.375 Dec C
14	5.1418E-01	SME(1)TEL	4	0.514 Volts
15	4.4139E-00	SME(2)TEL	4	4.414 Volts
16	-1.0000E-04	SNE PR U7	3	ERROR
17	0.5536E-01	SAN1XBNP2	4	0.255 Volts
18	0.8891E-01	EU=+27V	4	28.891 Volts
19	-0.8832E-01	EU=-27V	4	-28.832 Volts

```

Data Tape Identifier:          FID6
Track for Data:                8
[1]it. Col Data File Number:   5
[2]an Data File Number:       5
[3]ore Age Scan Data File Number: 7
[4]oothing Coeffs File Number: 8

```

IF 'EP-DE' 48 OCCURS DURING MARKING OF TAPE:

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Time of day: 11:15:11.25

Factor	IFRR Counts	Project Minutes	No. of b
POP5	1.00 -2.90	-6.7170900E-02	1.6423515E 05
FIP4	15-135.15 112.89	0.0000000E 00	2.4485542E 06
P2P3	223400.84 234.37	6.7159100E-02	1.7254357E 04

K = 0.500100

Bumper A: 331946.76

Bumper B: -3127.97

CROSS SCAN conversion factor: 0.402rad/IFRR count

CROSS AXIS THERM DRIFT RATE: 0.16rad/min

CROSS SCAN linear term removed: 97.01rad

diff factor: 0.500100

-----POP5-----

Along	Cross	A-Octal-B	Minutes:
3.00	0.00		961.98
0.00	0.00		

-----BUMPER B-----

Along	Cross	A-Octal-B	Minutes:
Ave -3127.00	-1.00		962.37
Stdev 0.00	0.00		

-----FIP2-----

Along	Cross	A-Octal-B	Minutes:
Ave 164250.00	114.62		962.62
Stdev 0.00	0.75		

-----BUMPER A-----

Along	Cross	A-Octal-B	Minutes:
Ave 331944.00	239.60		963.05
Stdev 0.00	0.50		

-----P2P3-----

Along	Cross	A-Octal-B	Minutes:
Ave 328396.39	236.19		963.25
Stdev 0.49	0.39		

-----POP5-----

Along	Cross	A-Octal-B	Minutes:
-0.25	0.55		963.82
Stdev 0.25	0.55		

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TELEMETRY PRINTOUT: 2: tape AT-F, trk 0, file 16, rev 22381

TELEMETRY PRINTOUT: 1: tape AT-F, trk 0, file 15, rev 22381

Date: 022781 Time: 1556

Test Designation: F-1 ACCEPT TEST
Serial Number: 4
Run Number: 22781.1556
Last Flow Event: H
Test Number: 3
Sequence Number: 6

Data type Identifier: F106
Block for Data: 0
BIT CAL data file number: 5
CAN data file number: 6
NORM AVG SCAL data file number: 7
Soothing Coeffs file number: 8

Mode selected: NORM

TELEMETRY PRINTOUT: 2: tape AT-F, trk 0, file 16, rev 22381

Data Date: 022781 Data Time: 1556

BUMPER MODE operation

Scan N: 1 no. of words transferred = 837

Line N-1: 005 006 020 000

Transfer to Bumper Time, N-1: 71342.8

Final Time, N: 60743.11

TELEMETRY

Byte No	Name	Contents	Pulses	Time(μsec)
1	SYNC	200		
2	OPSTAT N	046		
3	SONLIN N	130	88	16.58
4	5 TRNERR N	000 000	0	0.00
5	7 TORPLS N	355 371	-4615	-869.70
8	9 SHSERR N-1	000 000	0	0.00
10	11 FHSEPP N-1	000 000	0	0.00
13	14 SUMERR N-1	377 355 371	-4615	-869.70
15	16 SONCTR	000 265		
17	SONLIN N-1	250	-88	-16.58
18	19 TRNERR N-1	000 000	0	0.00
20	21 TORPLS N-1	356 246	-4442	-837.10
22	23 SHSERR N-2	000 000	0	0.00
24	25 FHSEPP N-2	000 000	0	0.00
27	28 SUMERR N-2	377 356 246	-4442	-837.10
29	30 31 SONTYM N-2	004 350 031	322329	60743.01
32	NECANIS	242		

No. Scans = 162 (decimal)

ORIGINAL PAGE IS
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scan N: 2 no. of words transferred = 832

Line Length, N-1: 005 306 317 377
Bumper to Bumper Time, N-1: 71342.6
Final Time, N: 60743.11

TELEMETRY

Byte No	Name	Contents	Pulses	Time(used)
1	SYNO	200		
2	OPSTAT N	246	Bit 7 = 1: Scan N= Reverse	
3	SCHLIN N	250	-88	-16.58
4 5	TRNERR N	000 000	0	0.00
6 7	TORPLS N	355 247	-4441	-836.91
8 9	SHSERR N-1	000 070	0	0.00
10 11	FHSERR N-1	000 050	0	0.00
12 13 14	SUMERR N-1	377 356 246	-4442	-837.10
15 16	SCHCTR	000 265		
17	SCHLIN N-1	130	88	16.58
18 19	TRNERR N-1	000 000	0	0.00
20 21	TORPLS N-1	355 371	-4615	-869.70
22 23	SHSERR N-2	000 000	0	0.00
24 25	FHSERR N-2	000 000	0	0.00
26 27 28	SUMERR N-2	377 355 371	-4615	-869.70
29 30 31	SCHTYM N-2	004 353 030	322328	60742.82
32	NSCANS	037	No.Scans =	31 (decimal)

scan N: 2 no. of words transferred = 832

Line Length, N-1: 005 306 317 377
Bumper to Bumper Time, N-1: 71342.6

ORIGINAL PAGE IS
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DATA SHEET 4.3.4-1
SCAN PROFILES
ALONG SCAN

TS 32015-004
8 March 1980

SMA Designation **F-1 ACCEPT TEST** **SAN MODE** **S/N 4** **SME (1) or (2) 2** **22.9-22.8 6.7**
(Nominal Voltages)

T1 T2 T3 T4 T5 T6 T7 T8 T9 **26.1 25.8 25.4 25.0 25.7 26.9 22.7 24.3 24.4**

SAN ANGLES USED (MRAD) **-67.182 67.183**

IPAR COUNTS K - **0.529931**

CALIBRATION

BUMPER A **323**

P2 P3 **328441 328447 328437**

MID P1 P4 **164258 164261 164245**

P0 P0 **0 5 1**

BUMPER B **3115**

OFFSET-CORRECTED SCAN ANGLES (REF P0), MRAD:

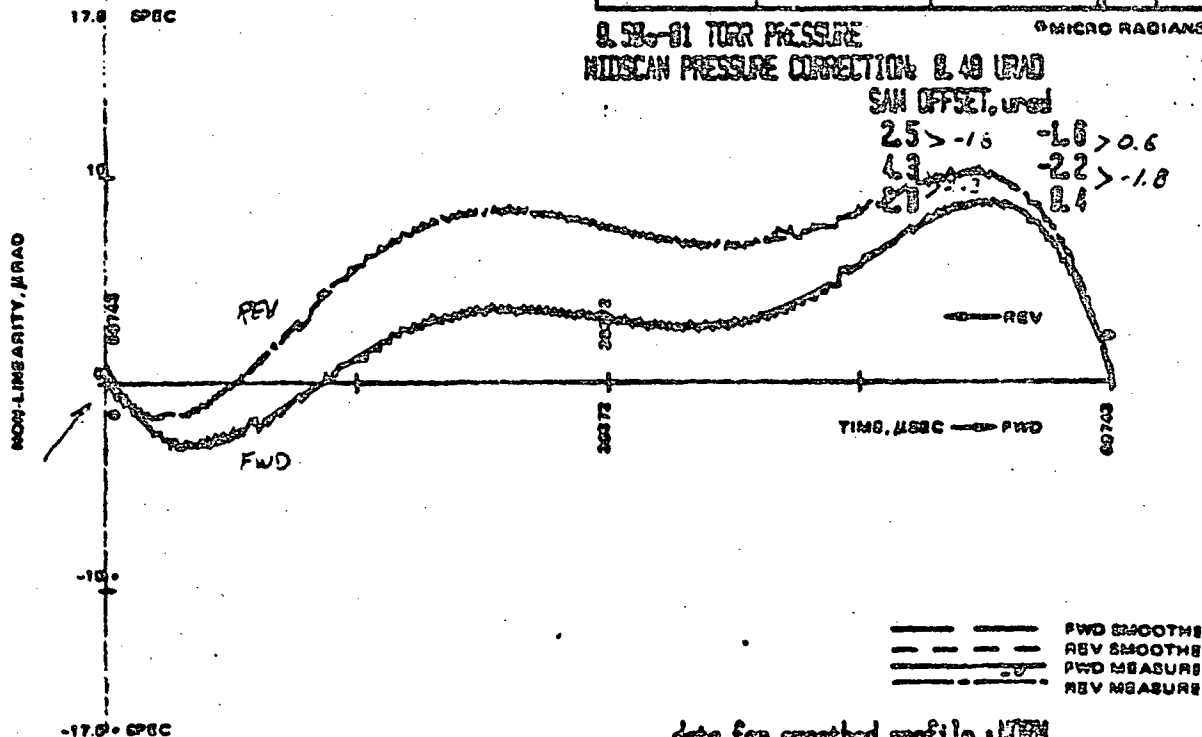
P2 **134342** P3 **134338**

P1 **67184** P4 **67178**

P0 **0** P5 **-2**

NEXT P0 **0**

ORDER (T)	FWD	REV	SPC	P/P
0	0.1537-87	-2.4432-87		
1	-1.7303-83	3.1136-83		
2	2.4187-81	-1.1818-81		
3	-1.1266-81	1.3376-81		
4	2.1593-82	-2.3225-82		
5	-1.4765-83	1.4765-83		
INFLECTION POINTS	3	3		
MAX -	6.7	18.1		
MAX -	-3.1	-1.7		
AVERAGED TO SMOOTHED	0.2	0.2		



Run No. **22781.1698**

Test Flow Event **H-14**

Comments **3306-14**

QA Stamp

Tested By

Date **22781**

NOTE SMALL DIP @ START OF FWD - CHANGES

OFFSET PROFILE - SHOULD USE
LATER PROFILE FOR GROUND
PROCESSING

WAT-11
1742-11
NO. REQ'D
VELLUM

ORIGINAL PAGE 19
OF POOR QUALITY

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DATA SHEET 4.3.4-2
SCAN PROFILES
ALONG SCAN SMOOTHED

TS 32015-004
8 March 1980

SMA Designation F-1 ACCEPT TEST

SAW NODE S/N 4

SME (1) or (2) 2
(Nominal Voltages)

K = 0.502291
FWD MIDSCAN
REV MIDSCAN
NESTED, MIDSCAN:
NON-NESTED, MIDSCAN

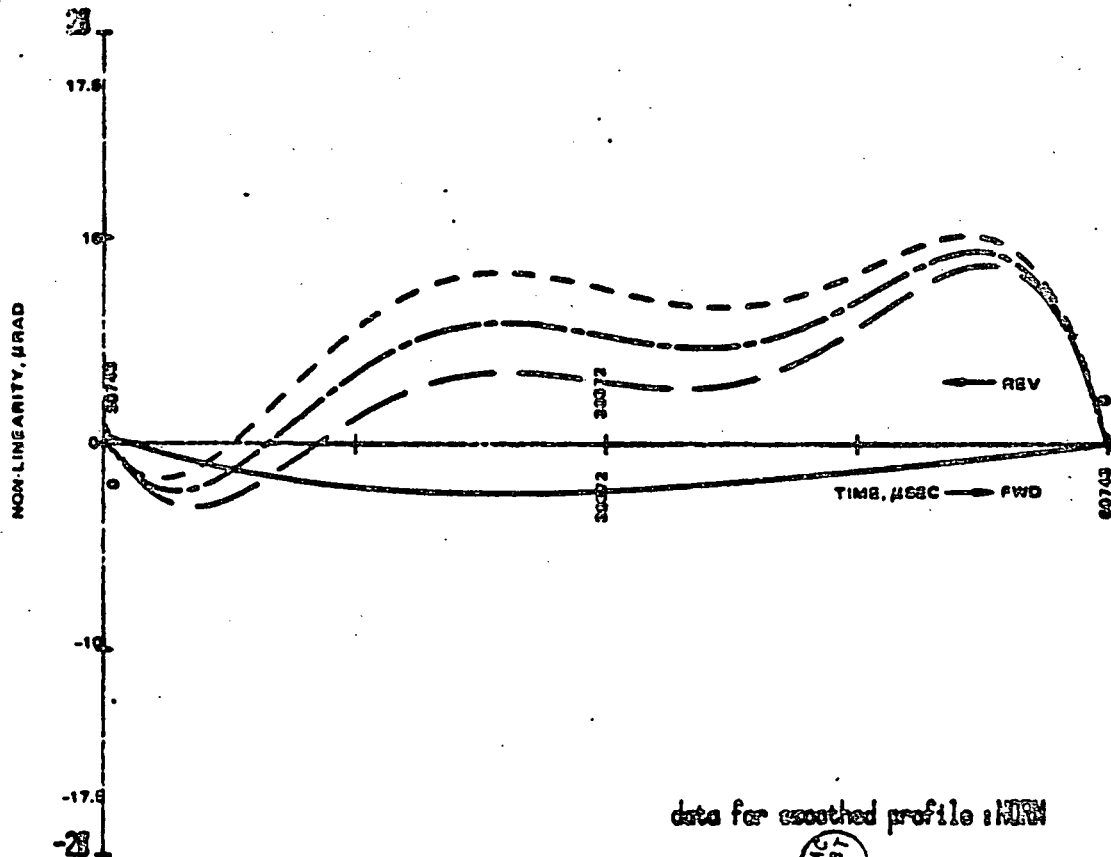
2.97
2.34
1.21
-2.28

from SMOOTHED PROFILES

23.9 - 22.8 0.7

PERIOD	FWD	REV
1st HALF	68742.81	68743.08
2nd HALF	33374.79	33369.33
PHI ₁	33369.02	33373.67
PHI ₁₀ , PHI ₁₀₀	3.08 3.41	0.34 6.20
	3.19	0.02

==== FWD SMOOTHED
==== REV SMOOTHED
==== NESTED, SMOOTHED
==== NON-NESTED SMOOTHED



data for smoothed profile: NESTED

Run No. 22781.1688

QA Stamp _____ Date 22781

Test Flow Event H-14 seq 6

Tested By _____

Comments test no. 141 FWD/1 REV SCAN, 400pts each

0

ORIGINAL PAGE IS
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DATA SHEET 4.3 4-3
SCAN PROFILES
BAND TO BAND REGISTRATION
SAW MODE

TS 32015-004
8 March 1980

SMA Designation **F-1 ACCEPT TEST**

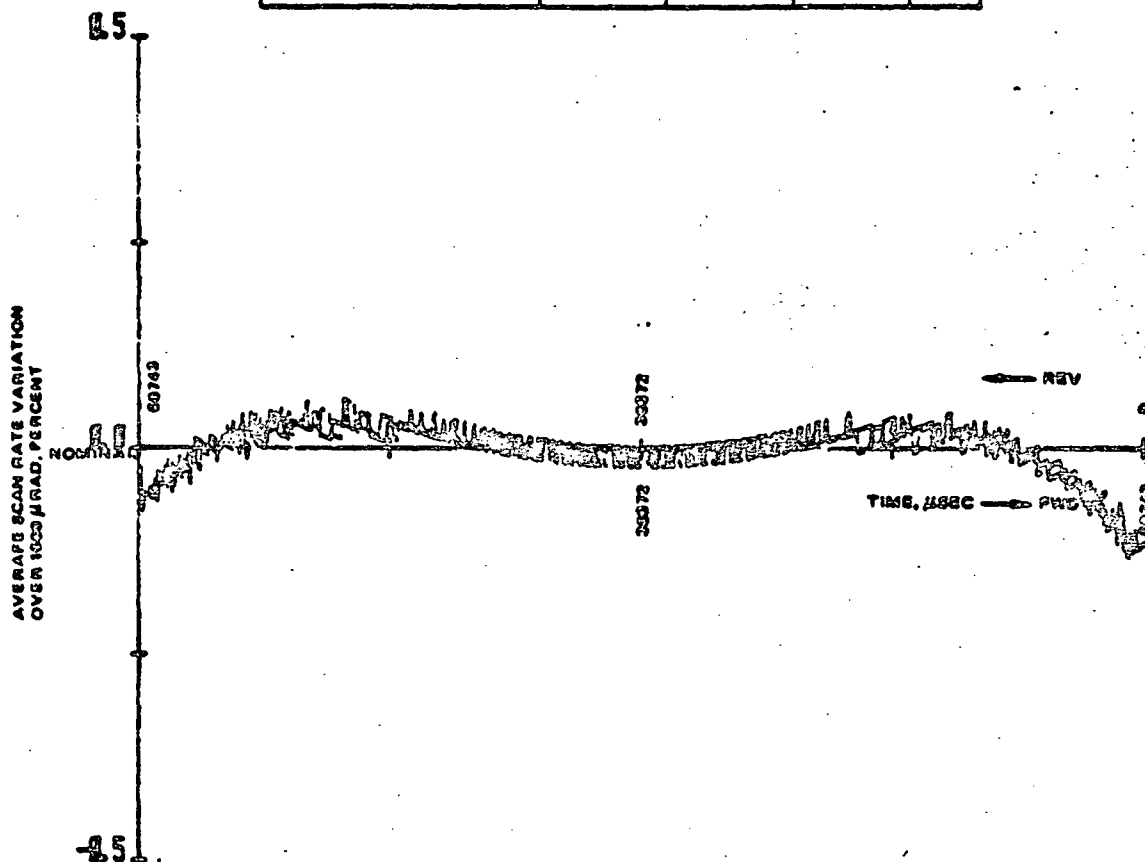
S/N 4

SME (1) or (2)
(Nominal Voltage)
21.9 - 21.9 8.7

BAND SEPARATION = 75.8 IFV (1878.2 JAW)

	FWD	REV	SPEC	P/P
PEAK AVG SCAN RATE	8.124	8.132	XXXX	XXXX
AVG SCAN RATE (90% OF SCAN) LESS THAN:	8.844	8.845	XXXX	P

FWD
REV



data used for computations = RAW

Run No. **22781.1003**

Test Flow Event **H-14** 8.844

Comments **test no. 14**

QA Stamp

Tested By

Date

ORIGINAL PAGE IS
OF POOR QUALITY

104

DATA SHEET 4.3.4.4
SCAN PROFILES
CROSS SCAN
SAM MODE

TS 32015-004
8 March 1980

SMA Designation F-1 ACCEPT TEST

S/N 4

SME (1) or (2) 2 28.9-28.8 0.7
(Nominal Voltages)

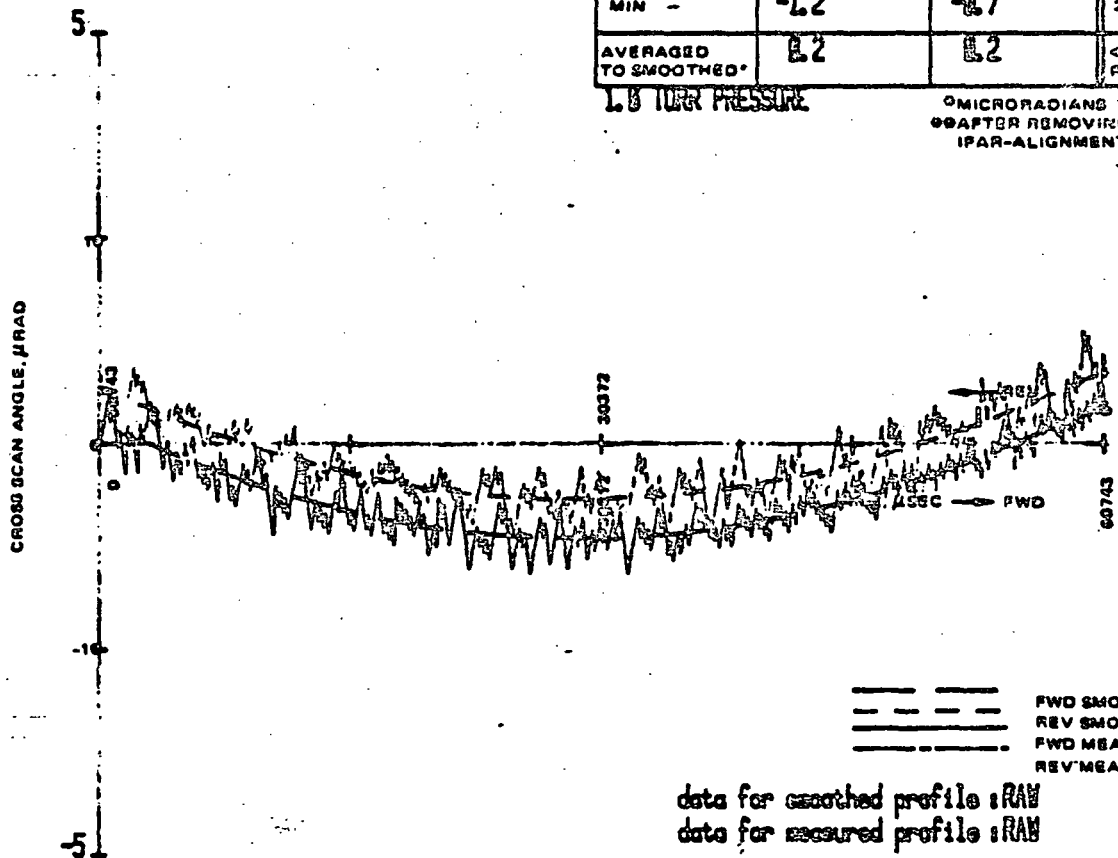
FORWARD LINEAR TERM
REMOVED TO CORRECT FOR
IPAR ALIGNMENT TERM
-- FWD TERM: 56.53 W-00

SMOOTHING POLYNOMIAL COEFFICIENTS**

ORDER (I)	FWD	REV	SPEC	P/P
0	2.5341e-07	8.7769e-07		
1	-9.3489e-05	-9.5462e-05		
2	1.2652e-03	1.5185e-03		
3	1.2885e-02	-8.1034e-03		
4	-1.3717e-01	2.7277e-01		
5	2.8443e-01	-2.3552e-01		
INFLECTION POINTS	0	0	<	P
MAX* + MIN -	0.5 -1.2	0.9 -0.7	+ - 20	P
AVERAGED TO SMOOTHED*	0.2	0.2	<1.0 RMS	P

1.0 TUR PRESSURE

0 MICRORADIANS
**AFTER REMOVING LINEAR
IPAR-ALIGNMENT TERM



Run No. 22781.1628

Test Flow Event H-14 seq 8

Comments test no. 14

QA Stamp Date 22781

Tested By

0

ORIGINAL PAGE IS
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TS 32015-004
8 March 1980

DATA SHEET 4.3.4-6
SCAN PROFILES
CROSS SCAN

SMA Designation F-1 ACCEPT TEST

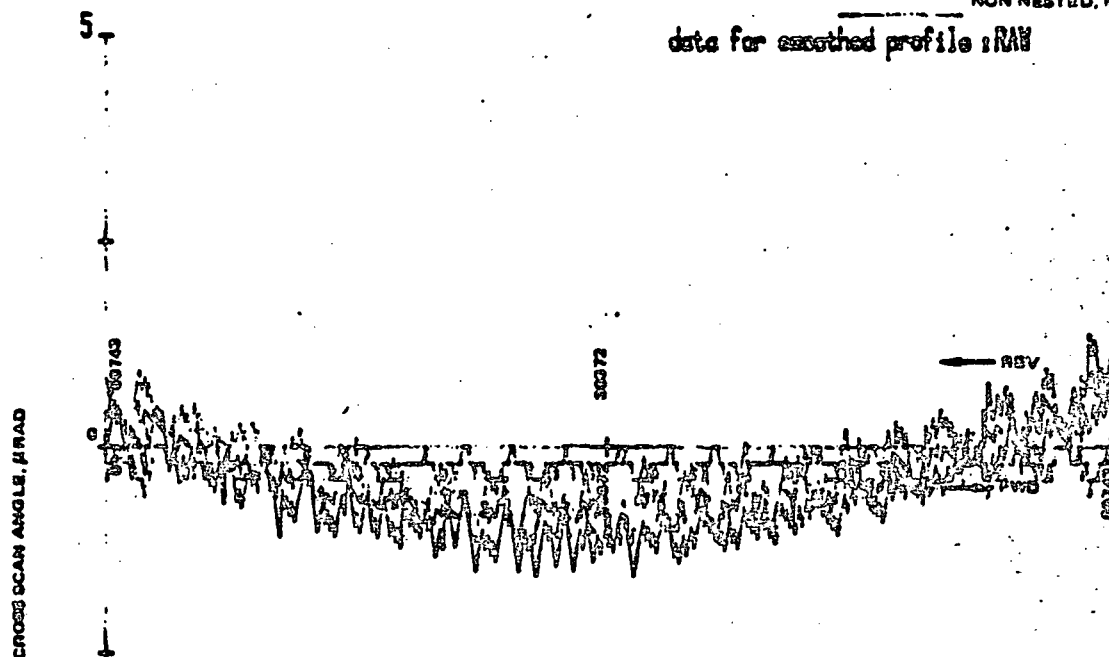
SAN MODE
SM 4

SME (1) or (2) 2
(Nominal Voltages)
28.9-28.8 8.7

50238-58

— FWD MEASURED
— REV MEASURED
— NESTED, MEASURED
— NON NESTED, MEASURED

data for smoothed profile: RAW



OVERLAP - UNDERLAP		
FWD TO REV CROSS SCAN PROFILE (2X NON-NESTED), μRAD	SPEC	P/P
|MAX| - 1.23	0.1 μRAD	P

Run No. 22781.1659

Test Flow Event H-14 seq 6

Comments test no 14

QA Stamp _____ Date 22781

Tested By _____

ORIGINAL PAGE IS
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File Name: OUTROBERT-PFM-trk1:file3:rev43080

Date Date: 6/27/81 Date Time: 1608

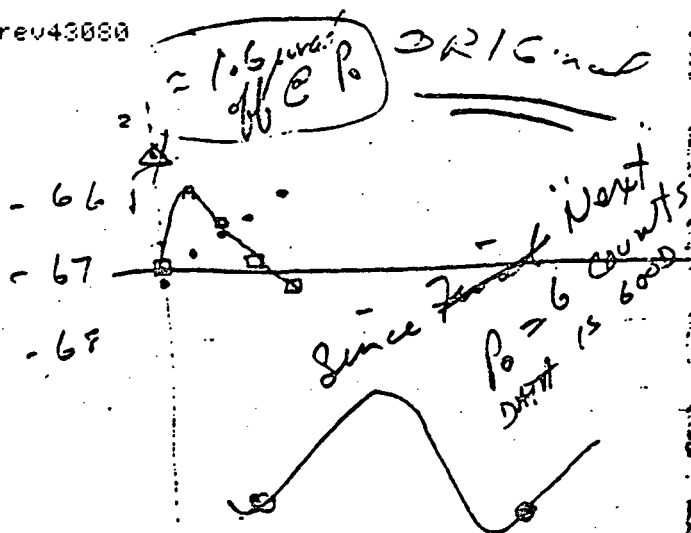
UFA Designation: F-1 ACCEPT TEST
Serial Number: 4
Run Number: 22781.1608
First Flow Event: H
Test Number: 14
Sequence Number: 6

Data Tape Identifier: FID5
Track for Data: 0
Initial Data File Number: 9
Scan Data File Number: 10
Normal-Ave Scan Data File Number: 11
Smoothing Coeffs File Number: 12

ALONG SCAN MEASURED PROFILE: RAO

scan sample

			ALONG			CROSS		
		IFAR	angle	nonlin		IFAR	angle	nonlin
		(count)	(mrad)	(urad)		(count)	(mrad)	(urad)
1	1	5	-67.180	0.00	-3	-0.001	0.00	
1	2	826	-66.844	0.58	-2	-0.001	0.17	
1	3	1645	-66.503	0.34	-1	-0.000	0.34	
1	4	2464	-66.173	0.09	0	0.000	0.50	
1	5	3283	-65.837	-0.17	0	0.000	0.26	
1	6	4102	-65.502	-0.44	1	0.000	0.43	
1	7	4921	-65.166	-0.71	1	0.000	0.19	
1	8	5741	-64.830	-0.98	1	0.000	-0.05	
1	9	6560	-64.495	-0.87	2	0.001	0.12	
1	10	7379	-64.160	-1.16	2	0.001	-0.13	
1	11	8198	-63.824	-1.46	2	0.001	-0.37	
1	12	9018	-63.488	-1.36	4	0.002	0.21	
1	13	9837	-63.153	-1.68	4	0.002	-0.03	
1	14	10657	-62.817	-1.59	5	0.002	0.14	
1	15	11476	-62.482	-1.92	5	0.002	-0.10	
1	16	12296	-62.146	-1.85	5	0.002	-0.35	
1	17	13115	-61.811	-2.20	7	0.003	0.23	
1	18	13935	-61.475	-2.14	7	0.003	-0.01	
1	19	14754	-61.139	-2.50	8	0.003	0.16	
1	20	15574	-60.804	-2.45	9	0.004	0.33	
1	21	16394	-60.468	-2.41	10	0.004	0.49	
1	22	17214	-60.132	-2.38	10	0.004	0.25	
1	23	18033	-59.797	-2.77	11	0.004	0.42	
1	24	18853	-59.461	-2.75	11	0.004	0.18	
1	25	19673	-59.125	-2.74	11	0.004	-0.06	
1	26	20492	-58.790	-3.14	11	0.004	-0.30	
1	27	21313	-58.454	-2.74	12	0.005	-0.14	
1	28	22133	-58.118	-2.75	13	0.005	0.03	
1	29	22952	-57.783	-3.17	13	0.005	-0.21	
1	30	23772	-57.447	-3.19	13	0.005	-0.45	
1	31	24592	-57.112	-3.32	14	0.005	-0.20	
1	32	25412	-56.776	-3.32				



ORIGINAL PAGE IS
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Collection: 11: tape HT-FM, trk 0, file 4, rev 022781



=====TEST INITIAL CONDITIONS=====

- [] Fans must be off for at least 20 min.
- [] Both Lasers must be on at least 45 min
- [] DTS temp (+Z-X) must be +/- 1 deg from (-Z-X)
- [] Chamber pressure must be less than 2 torr
- [] Cross axis polarity correct

Temperatures and Voltages

Ch	Scanner Out	Device	Cal	Measurement
4	2.0038E 03	SMA -Z	1	24.909 Deg C
12	9.9826E 03	MF(-Z-X)	3	24.331 Deg C
13	9.0783E 03	MF(+Z-X)	3	24.365 Deg C

File: 022781 Time: 1608

SMA Designation: F-1 ACCEPT TEST
 Serial Number: 4
 File Number: 22781.1608
 Test Flow Sheet: H
 Test Order: 14
 Quantity Number: 5
 Pressure: 0.00E 00 TORR

S(2)

INITIALIZE

Words Transferred: 4

Word Number 0: INTERRUPT (Raw 177771 Octal)

Bit	Description	Setting
0	Panel Mode	1
1	Calibrate Mode	0
2	Scan Mode	0

Word Number 1: PANEL STATUS (Raw 042402 Octal)

Bit	Description	Setting
0	Bumper SW On	0
1	Beq SAM P0/P3	1
2	Beq SAM P2/P5	0
3	Beq SAM PA/PB	0
45	Processed SAM	1
45	Raw SAM	0
45	SAM 1 or SAM 2	0
45	SAM 3 (CAL SAM)	0
5	Single Reset	0
7	End SAM P0/P3	0
8	End SAM P2/P5	1
9	End SAM PD/PE	0
10	Ext Reset	1
11	5 Facet	0
12	Calibrate Mode	0
13	Scan Mode	0
14	Initialize Mode	1
15	Slow Telemetry Mode	0

Word Numbers 2 and 3: (Raw 177633 057774 Octal)

Scan Count Preset:	7774 Octal	No. of Scans:	3
Time Count Preset:	3774565	No. of Samples:	400

Number of Scans of 64 Dimension: 3
 Error: 0.000000

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File 101965.00

File 101965.00 SNE: 2

	Along	Cross	A-Octal-B	Minutes:	
Ave	0.31	0.00			969.57
Stdev	0.41	0.00			

-----BUMPER B-----

	Along	Cross	A-Octal-B	Minutes:	
Ave	3103.10	-2.10			969.95
Stdev	0.30	0.37			

-----P1P2-----

	Along	Cross	A-Octal-B	Minutes:	
Ave	4253.10	14.44			970.27
Stdev	0.30	0.79			

-----BUMPER A-----

	Along	Cross	A-Octal-B	Minutes:	
Ave	101965.00	208.10			970.70
Stdev	0.00	0.31			

-----P2P2-----

	Along	Cross	A-Octal-B	Minutes:	
Ave	103441.00	235.95			970.90
Stdev	0.20	0.79			

-----P3P5-----

	Along	Cross	A-Octal-B	Minutes:	
Ave	0.99	-1.10			971.45
Stdev	0.20	1.18			

RE-CALIBRATION OF PREVIOUS MIRROR POSITION

	Along	Cross	A-Octal-B	Minutes:	
Ave	0.75	-0.58			971.87
Stdev	0.63	1.11			

RE-CALIBRATION OF PREVIOUS MIRROR POSITION

	Along	Cross	A-Octal-B	Minutes:	
Ave	0.31	-0.34			972.30
Stdev	0.21	0.43			

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Time of day: 11:11:11
Date: 1969-01-18

Focus	IFAR Counts	Preset Analogs	No. a, b
P0P5	0.34 -0.34	-6.7192000E-02	1.6425218E 05
P1P4	164252.18 113.74	0.0000000E 00	2.4466553E 06
P2P3	328441.06 235.48	6.7159700E-02	3.7788887E 03

K = 0.500096

Bumper A: 331969.02
Bumper B: -3104.97

USS SCAN conversion factor: 0.409urad/IFAR count
USS AXIS THERM DRIFT RATE: 0.14urad/min
USS SCAN linear term removed: 36.79urad

Time of day: 11:11:11

-----P0P5-----

	Along	Cross	A-Octal-B	Minutes:
Avg	0.37	0.92		972.92
Sigma	0.16	0.27		

-----BUMPER B-----

	Along	Cross	A-Octal-B	Minutes:
Avg	-3104.10	-1.70		973.30
Sigma	0.31	0.47		

-----P1P2-----

	Along	Cross	A-Octal-B	Minutes:
Avg	164251.00	115.76		973.67
Sigma	0.38	0.83		

-----BUMPER A-----

	Along	Cross	A-Octal-B	Minutes:
Avg	331969.00	240.00		974.08
Sigma	0.00	0.00		

-----P2P3-----

	Along	Cross	A-Octal-B	Minutes:
Avg	328441.17	236.44		974.30
Sigma	0.38	0.76		

-----P0P5-----

	Along	Cross	A-Octal-B	Minutes:
Avg	0.02	0.23		974.90
Sigma	0.13	0.42		

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OF POOR QUALITY

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Time at end of Cal: 1614.5-

Point	IFAR Counts	Preset Analogs	No. of b
P0P5	8.02 0.03	-6.7182800E-02	1.5425040E 05
P1P4	154150.40 115.33	0.0000000E 00	2.4468564E 06
P2P3	323440.60 236.23	6.7159700E-02	2.4251037E 03

K = 0.500091

Bumper A: 331968.61

Bumper B: -3104.87

CROSS SCAN conversion factor: 0.489urad/IFAR count

CROSS AXIS THERM DRIFT RATE: 0.14urad/min

CROSS SCAN linear term removed: 36.53urad

drift rate = 0.000005

File name: 00010000AT-FM, trf 0, fil 5, rev 22681

Time at end of SCAN: 1615.40 975.67

Time Between Cal and Scan: 0.36min

CROSS AXIS DRIFT: (last P0 to SCAN): -0.12urad

CROSS AXIS REFERENCE OFFSET: -0.03urad

Temperatures and Voltages

Ch	Spanner Out	Device	Cal	Measurement
0	-1.0000E 04	QUARTER	3	ERROR
1	2.2633E-02	EU=6.8I	5	2283.300 mAmps
2	1.4930E-03	EU=+27I	5	29.960 mAmps
3	-1.2810E-03	EU=-27I	5	25.820 mAmps
4	2.0050E 03	SMA -Z	1	24.955 Deg C
5	1.9450E 03	SMA -X	1	25.803 Deg C
6	1.9220E 03	SMA +Z	1	26.132 Deg C
7	1.9725E 03	SMA +X	1	25.407 Deg C
8	1.9546E 03	TORQ BRDG	1	25.665 Deg C
9	8.3536E 02	SME TEMP	2	29.745 Deg C
10	1.8681E 03	SAM TEMP	1	26.905 Deg C
11	6.7353E 00	EU=6.8V	4	6.735 Volts
12	9.0830E 03	MF(-Z-X)	3	24.328 Deg C
13	9.0784E 03	MF(+Z+X)	3	24.364 Deg C
14	3.1856E-01	SME(1)TEL	4	0.319 Volts
15	4.4141E 00	SME(2)TEL	4	4.414 Volts
16	-1.0000E 04	SME PR U7	3	ERROR
17	3.9090E 00	SAM1/BHP2	4	3.909 Volts
18	2.8891E 01	EU=+27V	4	28.891 Volts
19	-2.8832E 01	EU=-27V	4	-28.832 Volts

Data Tape Identifier: F1D6
Track for Data: 0
Init/Cal Data File Number: 9
Scan Data File Number: 10
Norm/Ave Scan Data File Number: 11
Smoothing Coeffs File Number: 12

IF 'ERROR' 48 OCCURS DURING MARKING OF TAPE:

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Final Time: 60743.11

TELEMETRY PRINTOUT.2: tapeRT-F, trk0, file16, rep22381

at 0217 Time: 1608

SRM Description: F-1 ACCEPT TEST

PL-11 Number: 4

Scan Number: 22781.1008

Test Flow Event: H

Test Number: 14

Test Name: 6

SRM Data Identifier: FID6

Scan Data: 0

BIT 0/L Data file number: 9

SCAN Data file number: 10

SRM Data file number: 11

SRM Data file number: 12

mode select: NORM

TELEMETRY PRINTOUT.2: tapeRT-F, trk0, file16, rep22381

at 0217 Time: 1608

SRM MODE: F-1

Scan N: 1 no. of words transferred = 837

Length: N-1: 377 140 014 000

Active Scan Time: N-1: 60742.62

Final Time: N: 60743.11

TELEMETRY

Byte No	Name	Contents	Pulses	Time(used)
1	SYNC	006		
2	OFSTAT N	106		
3	SONLIN N	130	88	16.58
4	5 TRNERR N	004 070	1080	203.53
5	7 TORPLS N	360 174	-3972	-748.52
6	9 SHSERP N-1	377 366	-10	-1.88
10	11 FHSERP N-1	000 014	12	2.26
12	13 14 SUMERP N-1	377 360 173	-3973	-748.71
15	16 SONCTR	000 137		
17	SONLIN N-1	350	-88	-16.58
18	19 TRNERR N-1	001 056	302	56.91
20	21 TORPLS N-1	357 321	-4143	-780.75
22	23 SHSERP N-2	000 023	19	3.58
24	25 FHSERP N-2	377 356	-18	-3.39
26	27 28 SUMERP N-2	377 357 321	-4143	-780.75
29	30 31 SONCTN N-2	004 353 030	322328	60742.82
32	NSCAN5	051	No.Scans =	41 (decimal)

Bit 7 = 0: Scan N= Forward

ORIGINAL PAGE IS
OF POOR QUALITY

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scan N: 2 no. of words transferred = 832

Line Length-N-1: 001 077 356 377
Initial Scan Time-N-1: 60742.81
Final Time-N: 60743.30

TELEMETRY

Byte No	Name	Contents	Pulses	Time(used)
1	SYN	246		
2	OPSTAT N	306		
3	SONLIN N	350		
4	TSNEFF N	001 055		
5	TORPLS N	357 322		
6	SHSERR N-1	000 023		
10	PHSERR N-1	377 356		
12	SUMERR N-1	377 357 322		
15	SONCTR	000 140		
17	SONLIN N-1	130		
18	TSNEFF N-1	004 070		
20	TORPLS N-1	360 174		
22	SHSERR N-2	377 366		
24	PHSERR N-2	000 014		
26	SUMERR N-2	377 360 173		
29	SONTYM N-2	004 353 027		
32	NSCANS	037		

Bit 7 = 1: Scan N= Reverse

No. Scans = 31 (decimal)

scan N: 2 no. of words transferred = 832

Line Length-N-1: 001 077 356 377

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DATA SHEET 4.3.4-1
SCAN PROFILES
ALONG SCAN

TS 32015-004
8 March 1980

SMA Designation F-1 ACCEPT TEST

BUMPER MODE
S/N 4

SME (1) or (2) 2

28.9-28.8 6.73

T2 T3 T4 T5 T6 T7 T8 T9
26.3 25.8 25.6 25.9 25.9 27.1 32.3 24.3

SMOOTHING POLYNOMIAL COEFFICIENTS

(Nominal Voltages)

ORDER (I)	FWD	REV	SP2C	P/F
0	2.8437e-07	-1.9555e-07		
1	-1.5641e-03	3.0571e-03		
2	2.3897e-01	-3.1312e-01		
3	-1.1288e-01	1.2993e-01		
4	2.1993e-02	-2.3552e-02		
5	-1.5112e-03	1.4948e-03		
INFLECTION POINTS	3	3		
MAX + MAX -	10.2 -2.9	10.1 -2.6	+ - 17.5	F
AVERAGED TO SMOOTHED	0.2	0.1	0.1 PASS	F

SAM ANGLES USED (MRAD) -67.2 67.2

IPAR COUNTS K - 0.583323

BUMPER A
P2 P3

MID P1 P4 FROM TPEG RUN 22781.1637

P0 P5

BUMPER B

OFFSET-CORRECTED SCAN ANGLES (REF P0), MRAD:

P2

P3

P1

P4

P0

P5

20

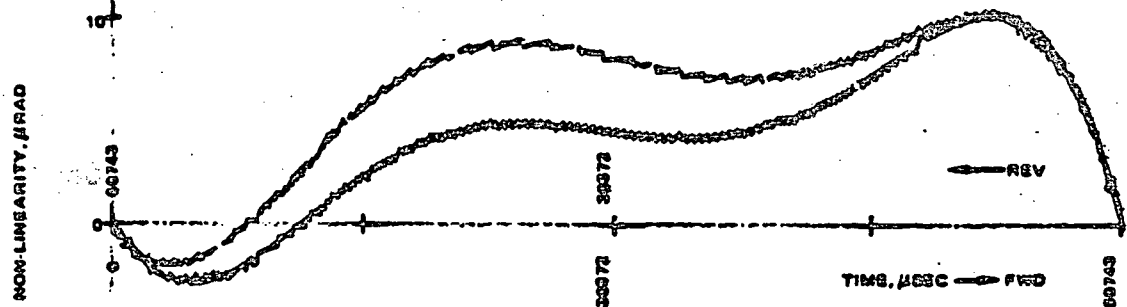
NEXT P0

17.5 SPEC

1.20e 02 Torr PRESSURE

0 MICRO RADIANS

MIDSCAN PRESSURE CORRECTION: 0.00 MRAD



--- FWD SMOOTHED
--- REV SMOOTHED
--- FWD MEASURED
--- REV MEASURED

data for smoothed profile: NRM
data for measured profile: NRM

Run No. 22781.1637

Test Flow Event H-15 seq 8

Comments test no 15

QA Stamp

Date

22781

Tested By

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DATA SHEET 4.3.4-2
SCAN PROFILES
ALONG SCAN SMOOTHED

BUNPER MODE
S/N 4

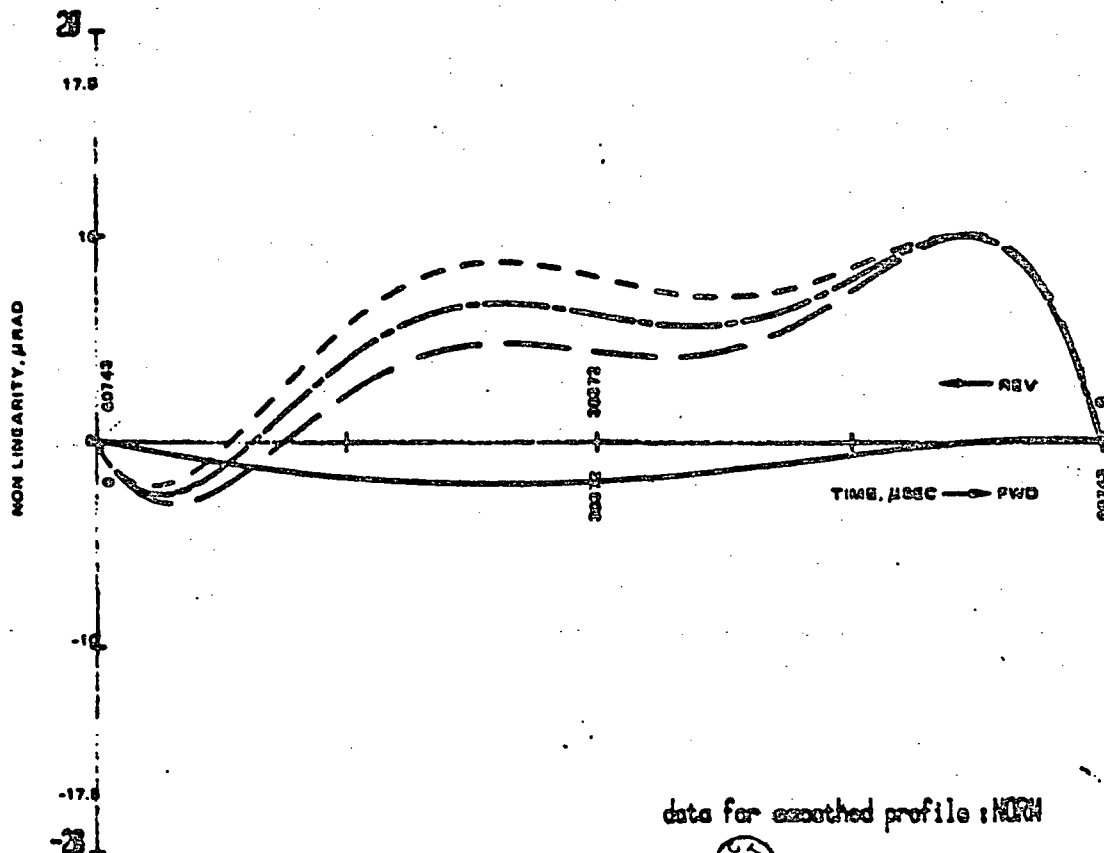
TS 32015-004
8 March 1980

SMA Designation F-1 ACCEPT TEST

K - TFEG RUN 22781.1637
PWO MIDSCAN 16.6
REV MIDSCAN 16.8
NESTED, MIDSCAN: ==
NON-NESTED, MIDSCAN: ==

SME (1) or (2) 2
(Nominal Voltages)
28.9 - 28.8 6.7

==== PWO SMOOTHED
==== REV SMOOTHED
==== NESTED, SMOOTHED
==== NON-NESTED SMOOTHED



data for smoothed profile: NORM

Run No. 22781.1637
Test Flow Event H-15 seq 6
Comments test no, 15

QA Stamp  Date 22781
Tested By 

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DATA SHEET 4.3.4-3
SCAN PROFILES
BAND TO BAND REGISTRATION

TS 32015-004
8 March 1980

SMA Designation **F-1 ACCEPT TEST**

WAFER NO

S/N 4

SME (1) or (2)2
(Nominal Voltages)

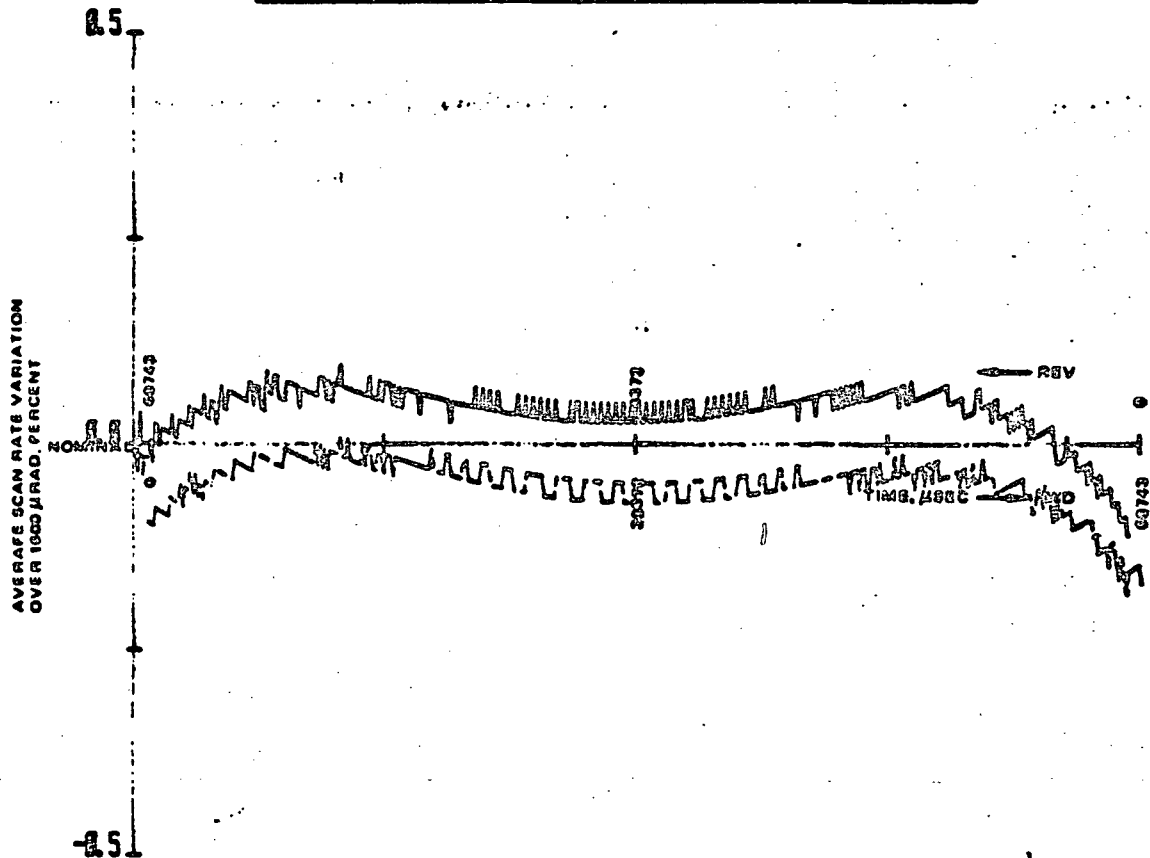
BAND SEPARATION = 75.0 IFV

(1678.2 μ RAD)

28.9 - 28.9 0.7

	PWD	REV	QPEC	P/F
PEAK AVG SCAN RATE	0.112	0.103	XXXX	XXXX
AVG SCAN RATE (50% OF SCAN) LESS THAN:	0.070	0.065	0.042	P

FWD
REV



data used for computations - RAV

Run No. 22781.1637

Test Flow Event H-15

seq 0.000

Comments test no. 15

QA Stamp

Tested By

Date

ORIGINAL PAGE IS
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DATA SHEET 4.3.4.4
SCAN PROFILES
CROSS SCAN
SUPER NOISE

TS 32015-004
8 March 1980

SMA Designation **F-1 ACCEPT TEST**

S/N 4

SME (1) or (2) **2** **21.9-21.8 0.7**
(Nominal Voltages)

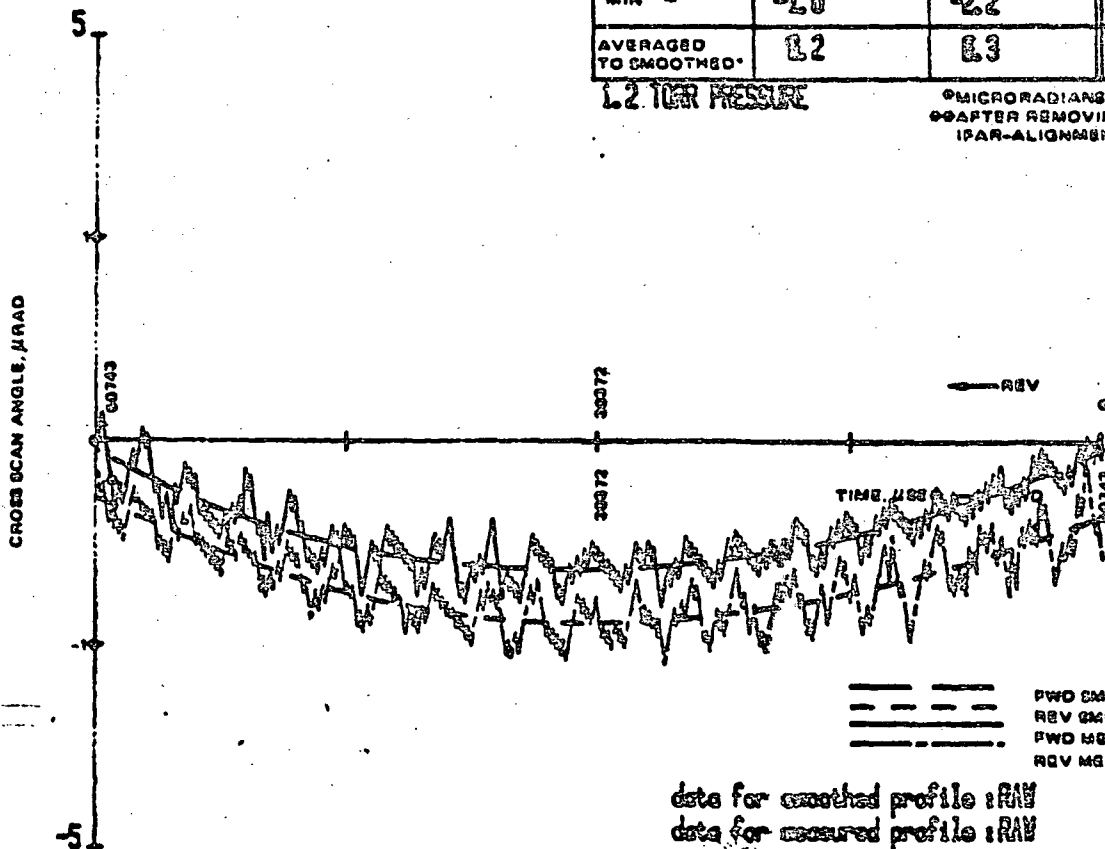
FORWARD LINEAR TERM
REMOVED TO CORRECT FOR
IPAR ALIGNMENT TERM
--FWD TERM: **36.73** used

SMOOTHING POLYNOMIAL COEFFICIENTS**

ORDER (I)	PWD	REV	SPEC	P/P
0	-1.223-87	-9.633-87		
1	-1.167-84	-2.27-85		
2	2.957-83	1.014-83		
3	-1.146-82	-2.633-82		
4	2.557-81	0.823-81		
5	-0.842-81	-0.182-81		
INFLECTION POINTS	0	0	4	-
MAX* MIN -	-1.1 -1.0	-1.7 -2.2	20	-
AVERAGED TO SMOOTHED*	0.2	0.3	43.0 RMS	-

L.2 TOR PRESSURE

*MICRORADIANS
**AFTER REMOVING LINEAR
IPAR-ALIGNMENT TERM



data for smoothed profile : RAW
data for measured profile : RAW

Run No. **22701.1637**
Test Flow Event **H-15** esq **8**
Comments **test no. 15**

QA Stamp **22701**
Tested By **8**

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TS 32015-004
8 March 1980

DATA SHEET 4.3.4-8
SCAN PROFILES
CROSS SCAN

SMA Designation F-1 ACCEPT TEST

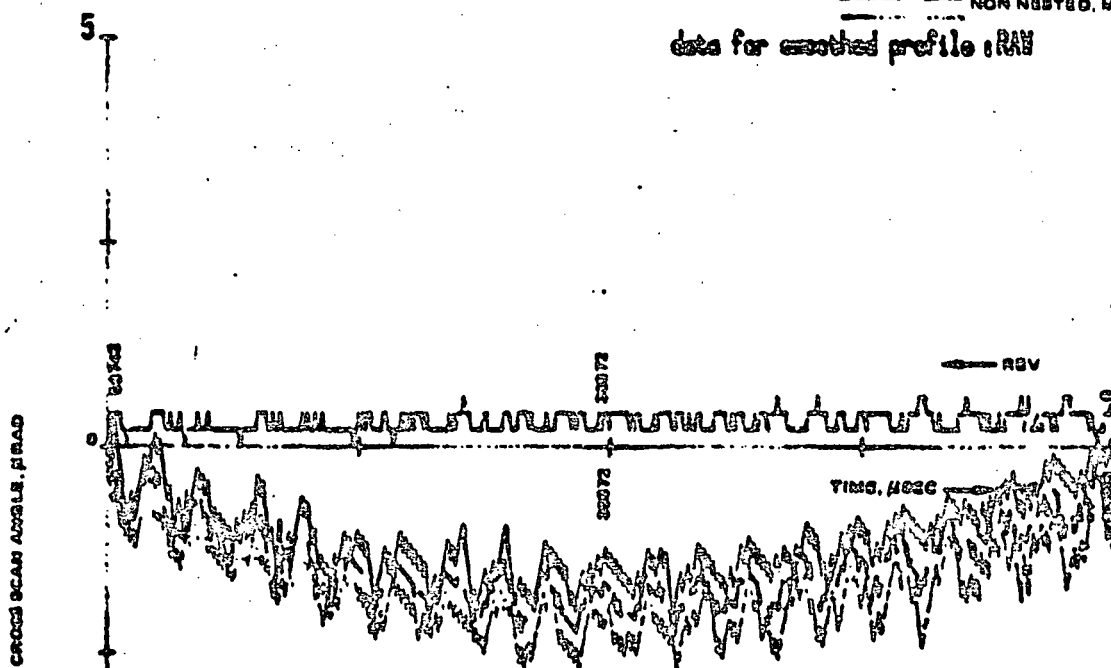
BURPER HIDE
SMA 4

SME (1) or (2) 2
(Nominal Voltages)
22.9-22.9 6.7

00718-23

— PWD MEASURED
— REV MEASURED
— NESTED, MEASURED
— NON NESTED, MEASURED

data for nested profile: RAN



OVERLAP - UNDERLAP		
PWD TO REV CROSS SCAN PROFILE (2X NON-NESTED), μRAD	SPEC	P/P
|MAX| - 1.23	0.1 μRAD	-

Run No. 22761.1637

Test Flow Event H-15 seq 8

Comments Test no. 15

QA Stamp

Tested By

Date

22761

data collection: litapah-FM-trk0:file4:rev022781



=====TEST INITIAL CONDITIONS=====

- 1) Fans must be off for at least 20 min.
- 2) Both Lasers must be on at least 45 min
- 3) ITS temp (+Z-X) must be +/- 1 deg from (-Z-X)
- 4) Chamber pressure must be less than 2 torr
- 5) Cross axis polarity correct

=====

Temperatures and Voltages

Ch	Scanner Out	Device	Col	Measurement
4	2.0051E 03	SMA -Z	1	24.953 Deg C
12	9.0302E 03	MFC-Z-X	3	24.326 Deg C
13	9.0702E 03	MFC+Z-X	3	24.429 Deg C

B(2)

Date: 02/27/81 Time: 1637

AMP Designation: F-1 ACCEPT TEST
Serial Number: 4
Run Number: 22781.1637
Test Flow Event: H
Test Number: 15
Sequence Number: 6

INITIALIZE Words Transferred: 4

Word Number 0: INTERRUPT (Row 177771 Octal)

Bit	Description	Setting
3	Panel Mode	1
1	Calibrate Mode	0
2	Scan Mode	0

Word Number 1: PANEL STATUS (Row 042402 Octal)

Bit	Description	Setting
0	Bumper SW On	0
1	See SAM P0/P3	1
2	See SAM P2/P5	0
3	See SAM PA/PB	0
45	Processed SAM	1
45	Raw SAM	0
45	SAM 1 or SAM 2	0
45	SAM 3 (CAL SAM)	0
6	Single Reset	0
7	End SAM P0/P3	0
8	End SAM P2/P5	1
9	End SAM PD/PE	0
10	Ext Reset	1
11	5 Facet	0
12	Calibrate Mode	0
13	Scan Mode	0
14	Initialize Mode	1
15	Slow Telemetry Mode	0

Word Numbers 2 and 3: (Row 177633 057774 Octal)

Scan Count Preset:	7774 Octal	No. of Scans:	3
Time Count Preset:	3774665	No. of Samples:	400

Bar of Scans of S# Dimension: 3
Scans of Samples: 1300

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DATE: 1975/05/01

Along Cross A-Octal-B

---Bumper B---

Along Cross A-Octal-B Minutes: 998.78
Along Cross A-Octal-B Minutes: 998.78

---CALIBRATION OF PREVIOUS MIRROR POSITION---

Along Cross A-Octal-B Minutes: 999.17
Along Cross A-Octal-B Minutes: 999.17

---BUMPER E---

Along Cross A-Octal-B Minutes: 999.58
Along Cross A-Octal-B Minutes: 999.58

---P1P2---

Along Cross A-Octal-B Minutes: 999.92
Along Cross A-Octal-B Minutes: 999.92

---BUMPER A---

Along Cross A-Octal-B Minutes: 1000.33
Along Cross A-Octal-B Minutes: 1000.33

---P2P3---

Along Cross A-Octal-B Minutes: 1000.60
Along Cross A-Octal-B Minutes: 1000.60

---P0P5---

Along Cross A-Octal-B Minutes: 1001.17
Along Cross A-Octal-B Minutes: 1001.17

Along Scan Calibration

At end of Cal: 1641.10

Facet	IFAR Counts	Preset Angles	No. a.b
P0P5	0.13 -1.09	-6.7182000E-02	1.6425165E 05
P1P4	164251.55 113.77	0.0000000E 00	2.4466694E 05
P2P3	328442.79 235.15	6.7159700E-02	2.6117373E 03

K = 0.500092

Bumper A: 331974.07
Bumper B: -3099.86

CP003 SCAN conversion factor: 0.409urad/IFAR count
CP003 RAIL THERM DRIPT RATE: 0.13urad/min
CP003 SCAN linear term removed: 96.63urad

Diff in K= 0.500092

-----P0P5-----

Along	Cross	A-Octal-B	Minutes:
Ave -0.68	0.33		1001.72
Sigma 0.88	0.47		

-----BUMPER B-----

Along	Cross	A-Octal-B	Minutes:
Ave -3102.00	-2.04		1002.10
Sigma 0.00	0.00		

-----P1P2-----

Along	Cross	A-Octal-B	Minutes:
Ave 164249.00	115.25		1002.38
Sigma 0.00	0.53		

-----BUMPER A-----

Along	Cross	A-Octal-B	Minutes:
Ave 331972.00	240.00		1002.80
Sigma 0.00	0.00		

-----P2P3-----

Along	Cross	A-Octal-B	Minutes:
Ave 328429.00	236.70		1003.00
Sigma 0.00	0.86		

-----P0P5-----

Along	Cross	A-Octal-B	Minutes:
Ave -1.64	0.42		1003.73
Sigma 0.48	0.79		

Along Scan Calibration
Time at end of Cal:1643.44

Facet	IFAR Counts	Preset Angles	No,a,b
P0P5	-1.64 0.42	-6.7182000E-02	1.6424836E 05
P1P4	164248.36 115.35	0.0000000E 00	2.4465776E 06
P2P3	328428.65 236.73	6.7159700E-02	6.7705003E 03

K = 0.500106

Bumper A: 331971.55
Bumper B: -3102.78

CP003 SCAN conversion factor: 0.409urad/IFAR count
CP003 RAIL THERM DRIPT RATE: 0.03urad/min
CP003 SCAN linear term removed: 96.66urad

..... 0.00 14

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-----P0P5-----
Along Cross A-Octal-B
Avg -1.00 0.00 Minutes: 1004.38
Sigma 0.00 0.00

-----BUMPER 2-----
Along Cross A-Octal-B
Avg -3100.00 -3.40 Minutes: 1004.78
Sigma 0.00 0.50

-----P1P2-----
Along Cross A-Octal-B
Avg 164251.00 114.52 Minutes: 1005.05
Sigma 0.00 0.50

-----BUMPER A-----
Along Cross A-Octal-B
Avg 331974.00 139.00 Minutes: 1005.45
Sigma 0.00 0.00

-----P2P3-----
Along Cross A-Octal-B
Avg 328442.75 235.85 Minutes: 1005.65
Sigma 0.40 0.00

-----P0P5-----
Along Cross A-Octal-B
Avg 1.00 -0.09 Minutes: 1006.23
Sigma 0.00 0.76

Along Scan Calibration
Time at end of Cal: 1646.14

Facet	IFAR Counts		Preset Angles		No. a,b
P0P5	1.00	-0.09	-6.7182000E-02	1.6425228E 05	
P1P4	164252.28	114.46	0.0000000E 00	2.4466677E 06	
P2P3	328443.39	235.82	6.7159700E-02	2.5424963E 03	

K = 0.500092

Bumper A: 331974.85
Bumper B: -3098.43

CROSS SCAN conversion factor: 0.409urad/IFAR count
CROSS AXIS THERM DRIFT RATE: 0.02urad/min
CROSS SCAN linear term removed: 96.50urad

diff in K= 0.000015

-----P0P5-----
Along Cross A-Octal-B
Avg 0.00 0.00 Minutes: 1006.97
Sigma 0.00 0.00

-----BUMPER B-----

ORIGINAL PAGE IS
OF POOR QUALITY

1

Align Cross A-Octal-B
Ave 154253.00 -1.30 Minutes: 1007.37
Sigma 0.00 0.41

-----P1P2-----

Align Cross A-Octal-B
Ave 154253.00 114.31 Minutes: 1007.72
Sigma 0.00 0.78

-----BUMPER A-----

Align Cross A-Octal-B
Ave 151976.00 239.00 Minutes: 1008.13
Sigma 0.00 0.00

-----P2P3-----

Align Cross A-Octal-B
Ave 153443.00 238.64 Minutes: 1008.35
Sigma 0.00 1.11

RE-CALIBRATION OF PREVIOUS MIRROR POSITION

Align Cross A-Octal-B
Ave 153443.00 235.50 Minutes: 1008.75
Sigma 0.40 0.68

-----P0P5-----

Align Cross A-Octal-B

Cross Data not 4XXX

Cross Data not 4XXX

Ave 0.00 -1.29 Minutes: 1009.36
Sigma 0.14 1.10

Align Scan Calibration
Time to end of Cal: 1649.13

Facet	IFAR Counts	Preset Angles	No. a, b
P0P5	0.98 -1.29	-6.7182000E-02	1.6425267E 05
P1P4	154253.67 113.43	0.0000000E 00	2.4466694E 06
P2P3	328443.59 235.19	6.7159700E-02	2.8045839E 03

K = 0.500093

Bumper A: 331976.49
Bumper B: -3098.19

CGS SCAN conversion factor: 0.409urad/IFAR count
CGS AXIS THERM DRIFT RATE: 0.23urad/min
CGS SCAN linear term removed: 96.73urad

ORIGINAL PAGE IS
OF POOR QUALITY

0.000000

Collector: 10-31:meAT-FM:trk0:file5:rev22681

Time at end of SCAN:1650.12 1010.20

Time between Cal and Scan: 0.94min

CROSS AXIS OFFSET: (last P0 to SCAN):-0.21urad

CROSS AXIS REFERENCE OFFSET:-0.74urad

Time at end of SCAN:1650.24 1010.40

Time between Cal and Scan: 1.06min

CROSS AXIS OFFSET: (last P0 to SCAN):-0.24urad

CROSS AXIS REFERENCE OFFSET:-0.77urad

Operator: and Voltages

CH	Source	Unit	Device	Cal	Measurement
0	-1.0000E-04		QUARTER	3	ERROR
1	3.2080E-02		EU=6.81	5	2288.000 mAmps
2	1.7510E-03		EU=+27V	5	30.620 mAmps
3	-1.2100E-03		EU=-27V	5	25.420 mAmps
4	3.0010E-03		SMA -Z	1	24.991 Deg C
5	1.5110E-02		SMA -X	1	25.947 Deg C
6	1.5105E-02		SMA +Z	1	26.253 Deg C
7	1.9524E-03		SMA +X	1	25.553 Deg C
8	1.9372E-03		TORQ BRDG	1	25.909 Deg C
9	8.1760E-02		SME TEMP	2	30.349 Deg C
10	1.9521E-03		SAM TEMP	1	27.134 Deg C
11	3.7335E-06		EU=6.8V	4	6.734 Volts
12	9.0802E-03		MF(-Z-X)	3	24.326 Deg C
13	9.0735E-03		MF(+Z+X)	3	24.361 Deg C
14	3.1935E-01		SME(1)TEL	4	0.319 Volts
15	4.4156E-00		SME(2)TEL	4	4.416 Volts
16	-1.0000E-04		SME PP U7	3	ERROR
17	3.9121E-00		SAM1/BMP2	4	3.912 Volts
18	2.8121E-01		EU=+27V	4	28.891 Volts
19	-2.8834E-01		EU=-27V	4	-28.834 Volts

Data Tape Identifier: FID6

Track for Data: 0

Initial Cal Data File Number: 13

Scan Data File Number: 14

Normal Scan Data File Number: 15

Smoothing Coeffs File Number: 16

IF 'ERROR' 48 OCCURS DURING MARKING OF TAPE:

Type to REMARK---press execute---press continue

TELEMETRY PRINTOUT, 1: tape AT-F, trk 0, file 15, rev 22381

Date: 022781 Time: 1637

SMA Designation: F-1 ACCEPT TEST
Serial Number: 4
Run Number: 22781.1637
Test Flow Event: H
Test Number: 15
Sequence Number: 6

B(2)

data tape identifier: F1D6
track for data: 0
INIT/CHL data file number: 13
SCAN data file number: 14
NORM-AVG SCAN data file number: 15
Smoothing Coeffs file number: 16

mode selected: NORM

TELEMETRY PRINTOUT, 2: tape AT-F, trk 0, file 15, rev 22381

Data Date: 022781 Data Time: 1637

BUMPER MODE operation.

scan N: 1 no. of words transferred = 837

Line Length, N-1: 005 306 324 000
Bumper to Bumper Time, N-1: 71343.5
Final Time, N: 60743.11

TELEMETRY

Byte No	Name	Contents	Pulses	Time(μsec)
1	SYNC	246		
2	OPSTAT N	146	Bit 7 = 0: Scan N= Forward	
3	SCHLIN N	130	88	16.58
4 5	TRNERR N	000 000	0	0.00
6 7	TORPLS N	355 105	-4795	-903.62
8 9	SHSERR N-1	000 000	0	0.00
10 11	FHSERR N-1	000 000	0	0.00
12 13 14	SUMERR N-1	377 355 110	-4792	-903.05
15 16	SCHCTR	000 326		
17	SCHLIN N-1	250	-88	-16.58
18 19	TRNERR N-1	000 000	0	0.00
20 21	TORPLS N-1	357 126	-4266	-803.93
22 23	SHSERR N-2	000 000	0	0.00
24 25	FHSERR N-2	000 000	0	0.00
26 27 28	SUMERR N-2	377 357 123	-4269	-804.49
29 30 31	SCHTYM N-2	004 353 025	322325	60742.26
32	NSCANS	310	No. Scans = 200 (decimal)	

scan N: 2 no. of words transferred = 832

Line Length, N-1: 005 306 315 377
Bumper to Bumper Time, N-1: 71342.2
Final Time, N: 60743.11

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TELEMETRY

Byte No	Name	Contents	Pulses	Time(used)
1	TIME	246		
2	OPSTAT N	346	Bit 7 = 1: Scan N= Reverse	
3	SCHLIN N	250	-88	-16.58
4	5 TRNERR N	000 000	0	0.00
6	7 TORPLS N	357 124	-4268	-804.31
8	9 SHSERR N-1	000 000	0	0.00
10	11 FHSERR N-1	000 000	0	0.00
12	13 14 SUMERR N-1	377 357 121	-4271	-804.87
15	16 SCHOTS	000 326		
17	SCHLIN N-1	130	88	16.58
18	19 TRNERR N-1	000 000	0	0.00
20	21 TORPLS N-1	355 105	-4795	-903.62
22	23 SHSERR N-2	000 000	0	0.00
24	25 FHSERR N-2	000 000	0	0.00
26	27 28 SUMERR N-2	377 355 110	-4792	-903.05
29	30 31 SCHTYM N-2	004 353 034	322332	60743.58
32	NSCANS	037	No.Scans =	31 (decimal)

scan N: 2 no. of words transferred = 832

Line Length N-1: 005 306 315 377

ORIGINAL PAGE IS
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Appendix B

Scan Mirror Assembly Acceptance Test Data

Part 11

Test Flow Event I

ORIGINAL PAGE IS
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TS 32015-004
8 March 1980

DATA SHEET 4.3.5-3
OPERATIONAL PERFORMANCE
ALONG SCAN GEOMETRIC REPEATABILITY

SAN HIDE (and calibrated)

SME (1) or (2) 1

Voltage: High 28.9, Nom 28.0, Low 0.0

SMA Designation F-1 ACCEPT TEST S/M

IPAR COUNTS:

CALIBRATION

BUMPER A

P2 P3

MID - P1 P4

P5 P6

BUMPER B

SCANNING

SAN OFFSETS, μ RAD

K = 1.52229

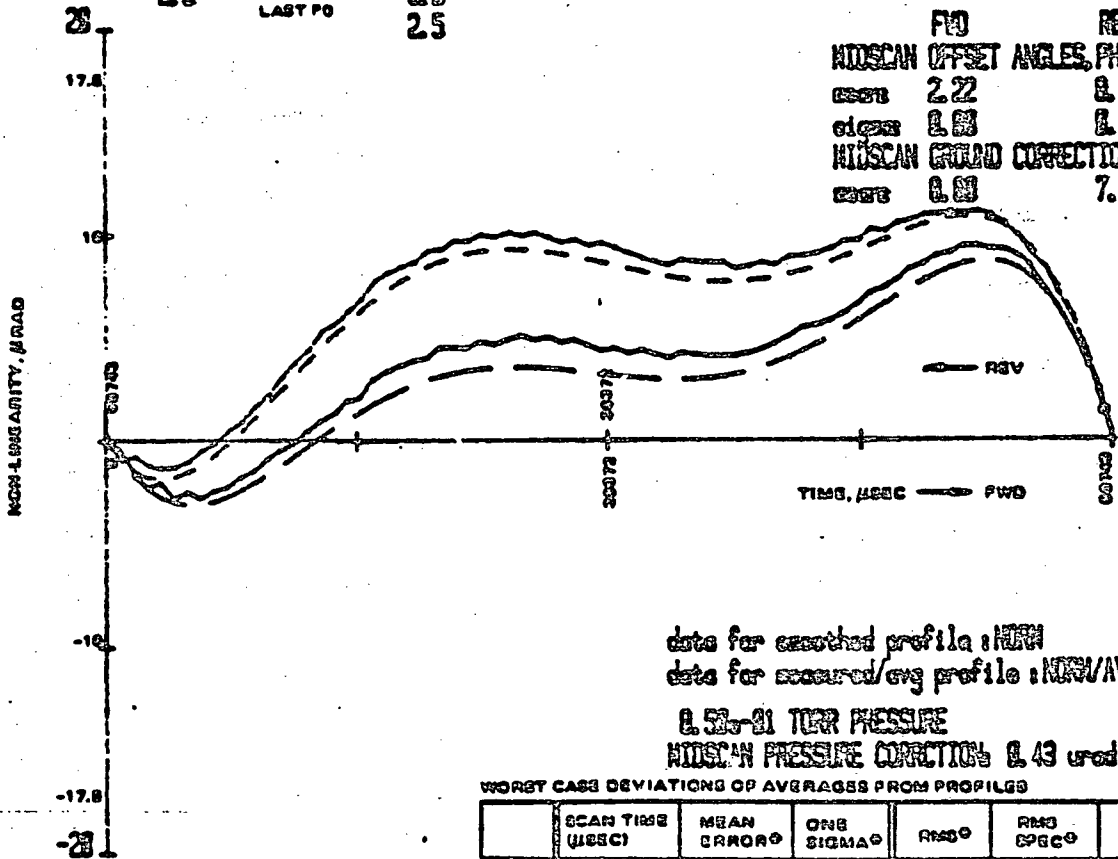
TEMP: T1 T2 T3 T4 T5 T6 T7 T8 T9
28.2 24.9 25.5 25.9 25.7 27.1 31.8 24.3 24.3

SAN ANGLES
USED (MRAD) -67.171 67.159

MEAN VALUES
P2 3.1 > 3.5 P3 2.8 > 0.2
P1 0.8 > 4.1 P4 2.8 > -0.4
P5 2.5
LAST P6 2.5

PWD SMOOTHED PROFILE
(FROM TYPICAL RUN NO. 274.153)
REV SMOOTHED PROFILE
MEASURED AVE, PWD
MEASURED AVE, REV

PWD REV
MIDSCAN OFFSET ANGLES, PHI, PHI-
corr 2.22 0.02
corr 0.00 0.00
MIDSCAN GROUND CORRECTION
corr 0.00 7.67



data for smoothed profile: NORN
data for measured/avg profile: NORN/AVG

0.51-01 Torr Pressure
MIDSCAN PRESSURE CORRECTION 0.43 used

WORST CASE DEVIATIONS OF AVERAGES FROM PROFILES

	SCAN TIME (μ SEC)	MEAN ERROR	ONE SIGMA	RMS	RMS SPEC	P/F
PWD	25781.08	1.38	0.21	1.39		
REV	32334.46	0.02	0.24	0.05	<1.70	P

Run No. 1128L 0139

Test Flow Event I-1

Comments test no. 1.19 PWD/19 REV SCAN, 75pts each

QA Stamp

Tested By

Date

3/2/81

ORIGINAL PAGE 18
OF POOR QUALITY

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TS 32015-004
8 March 1980

DATA SHEET 4.3.6-3
OPERATIONAL PERFORMANCE
ALONG SCAN GEOMETRIC REPEATABILITY

SMA Designation F-1 ACCEPT TEST S/N

SAN NOTE (and calibrated) deviation profile

ME (1) or (2) 1

Voltage: High, Nom, Low

IPAR COUNTS:

CALIBRATION

BUMPER A
P2 P2

MID - P1 P4

P0 P0

BUMPER B

SCANNING

MEAN
VALUES

P2
P1
P0

3.1
6.6
2.5

P3
P4
P5

2.9
2.6
3.0

LAST P0

2.9
2.6
3.0
2.5

TEMP: T1

T2

T3

T4

T5

28.9

-28.8

0.9

28.2

24.9

25.5

25.9

25.7

27.1

28.0

24.3

24.3

SAN ANGLES
USED (MRAD)

-67.171

67.150

FWD SMOOTHED PROFILE
(FROM TPE-M RUN NO. 2770 1548)
REV SMOOTHED PROFILE
MEASURED AVG, FWD
MEASURED AVG, REV

FWD REV
MIDSCAN OFFSET ANGLES, PHIF, PHIL
slope 2.22 1.82
slope 1.80 1.80
MIDSCAN GROUND CORRECTION
slope 1.80 7.87

NON-LINEARITY, μ RAD

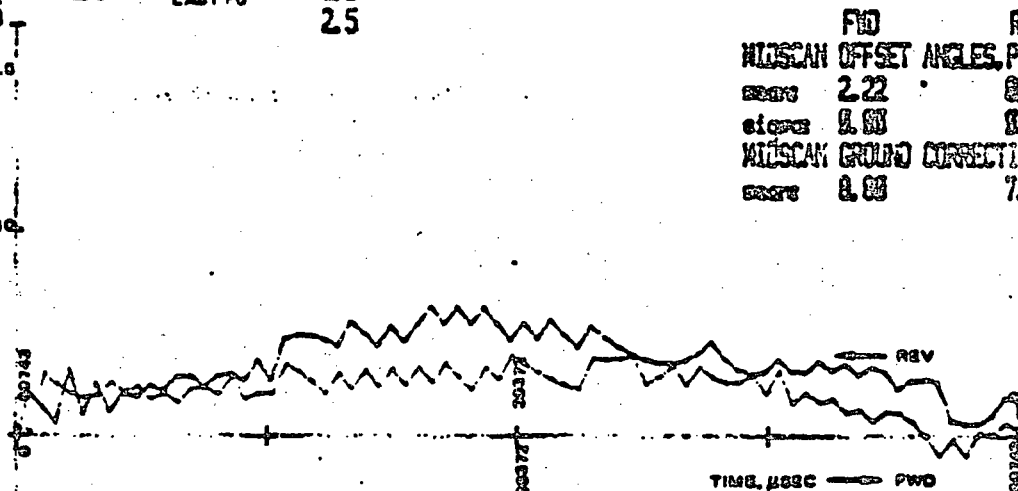
17.0

10

-10

-17.5

-5



date for smoothed profile: N/A
date for measured/avg profile: N/A

0.55-01 TIER PRESSURE
MIDSCAN PRESSURE CORRECTION 0.43 used

WORST CASE DEVIATIONS OF AVERAGES FROM PROFILES

	SCAN TIME (μSEC)	MEAN ERROR	ONE SIGMA	RMSC	RMS SPEC	P/P
FWD	28721.09	1.33	0.21	1.39		
REV	32354.46	0.82	0.24	0.85	41.75	P

Run No. 11281.0139

Test Flow Event I-1 seq 6

Comments test no 1 19 FWD/19 REV SCAN 75pts each

QA Stamp

Date 3/2/81

Tested By

ORIGINAL PAGE IS
OF POOR QUALITY

DATA SHEET 4.3.5-4
OPERATIONAL PERFORMANCE
CROSS SCAN REPEATABILITY

TS 32015-004
8 March 1980

SMA Designation F-1 ACCEPT TEST S/N4

SAW MODE

SME (1) or (2) 1

Volts: High —, Nom —, Low —

28.9 -28.8 0.0

FORWARD LINEAR IPAR-ALIGNMENT
TERM REMOVED:

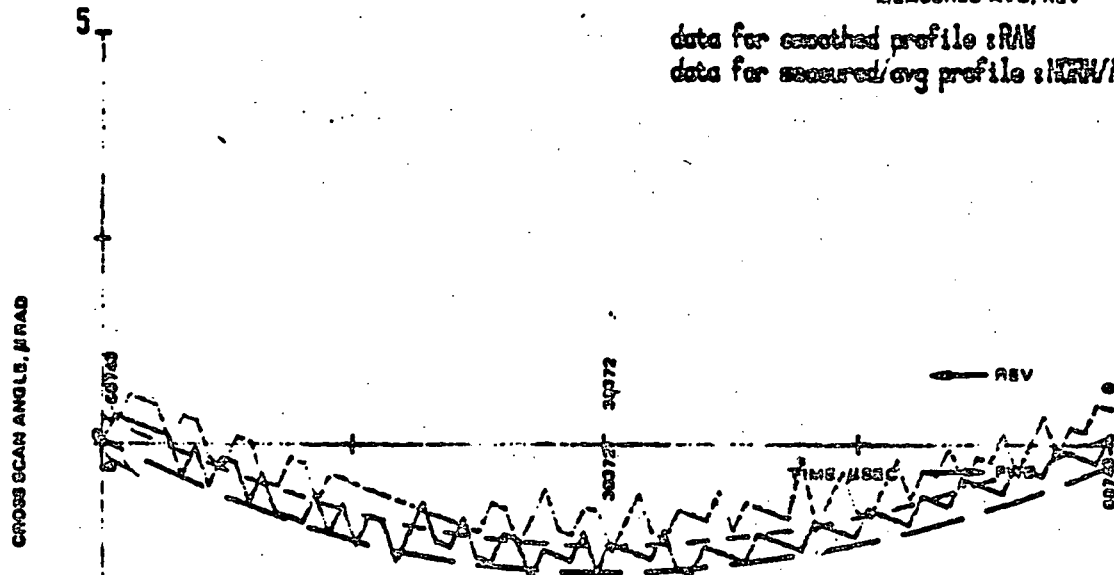
98.93 μ rad

(FROM TPE-F RUN NO.

— PWD SMOOTHED PROFILE
(FROM TPE-F RUN NO. 11281.0139)
— REV SMOOTHED PROFILE
— MEASURED AVG. PWD
— MEASURED AVG. REV

data for smoothed profile : RAW

data for measured avg profile : RAW AVG



WORST CASE DEVIATIONS OF AVERAGES FROM PROFILES **						
	SCAN TIME (MSEC)	MEAN ERROR *	ONE SIGMA *	RMS *	RMS SPEC *	P/P
PWD	972.34	0.54	0.15	0.55		P
REV	1832.57	0.75	0.28	0.77	<1.0	

PRESSURE:

0.532-01

* MICRORADIANS
** AFTER REMOVING THE LINEAR
IPAR-ALIGNMENT TERM THAT WAS REMOVED
FROM THE ORIGINAL PROFILE

Run No. 11281.0139

Test Flow Event I-1 esq 8

Comments test no. 1

QA Stamp

Date

11281 3/2/81

Tested By

INITIALS:

Words Transferred: 4

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Word Number 0: INTERRUPT (Raw 177771 Octal)

Bit	Description	Setting
0	Panel Mode	1
1	Calibrate Mode	0
2	Scan Mode	0

Word Number 1: PANEL STATUS (Raw 040402 Octal)

Bit	Description	Setting
0	Bumper SW On	0
1	See SAM P0/P3	1
2	See SAM P2/P5	0
3	See SAM PA/PE	0
4	Processed SAM	1
5	Raw SAM	0
6	SAM 1 or SAM 2	0
7	SAM 3 (CAL SAM)	0
8	Single Reset	0
9	End SAM P0/P3	0
10	End SAM P2/P5	1
11	End SAM PA/PE	0
12	Ext Reset	0
13	5 Facet	0
14	Calibrate Mode	0
15	Scan Mode	0
16	Initialize Mode	1
17	Slow Telemetry Mode	0

Word Numbers 2 and 3: (Raw 176747 057730 Octal)

Scan Count Preset:	7730 Octal	No. of Scans:	39
Time Count Preset:	3757165	No. of Samples:	75

Number of Scans of S# Dimension:	41
Scans & Samples:	3075
Number of Samples plus 1:	76
Dimension of S# Array:	14950
Dimension of W# Array:	82

CALIBRATE: SAM/SME: 1

-----P0P5-----

	Along	Cross	A-Octal-B	
Ave	1.00	0.00	Minutes:	102.60
Sigma	0.00	0.00		

-----BUMPER B-----

	Along	Cross	A-Octal-B	
Ave	-3110.00	-2.00	Minutes:	103.07
Sigma	0.00	0.00		

-----P1P2-----

	Along	Cross	A-Octal-B	
Ave	104232.00	113.69	Minutes:	103.33
Sigma	0.00	0.59		

-----BUMPER A-----

	Along	Cross	A-Octal-B	
Ave	221957.00	238.30	Minutes:	103.75
Sigma	0.00	0.47		

Signal 0.00 0.00

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-----7095-----

Along Cross A-Octol-B
A: -1.00 0.00 Minutes: 104.55
B: 0.00 0.70

ORIGINAL PAGE IS
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Line Scan Calibration
Time at end of Cal: 144.33

Point	IFAR Counts	Preset Angles	No. of b
7095	-2.00 0.00	-6.7170900E-02	1.6423013E 05
PIP4	154330.13 113.74	0.0000000E 00	2.4465566E 06
P2P3	329397.15 235.02	6.7159200E-02	1.6207029E 04

K = 0.500099

Bumper A: 331965.77

Bumper B: -3112.28

CROSS SCAN conversion factor: 0.409urad/IFAR count

CROSS AXIS THERM DRIFT RATE: 0.02urad/min

CROSS SCAN linear term desired: 96.10urad

data collection: 2; tape AT-FM, trk 0, file 5, rev 22631

Time at end of SCAN: 145.24 105.40

Time between Cal and Scan: 0.91min

CROSS AXIS DRIFT: (last P0 to SCAN): 0.02urad

CROSS AXIS REFERENCE OFFSET: 0.05urad

Chamber Pressure (torr): 0.85

Temperatures and Voltages

Ch	Scanner Out	Device	Cal	Measurement
0	-1.0000E 04	QUARTER	3	ERROR
1	2.0557E-02	EU=6.81	5	2255.700 mAmps
2	1.5920E-03	EU=+27I	5	31.840 mAmps
3	-1.2410E-03	EU=-27I	5	24.820 mAmps
4	2.0072E 03	SMA -Z	1	24.929 Deg C
5	1.9393E 03	SMA -X	1	25.877 Deg C
6	1.9152E 03	SMA +Z	1	26.230 Deg C
7	1.9689E 03	SMA +X	1	25.466 Deg C
8	1.9498E 03	TORQ, BRDG	1	25.734 Deg C
9	0.0578E 02	SME TEMP	2	30.028 Deg C
10	1.8566E 03	SAM TEMP	1	27.067 Deg C
11	6.7525E 00	EU=6.8V	4	6.752 Volts
12	9.0909E 03	MF(-Z-X)	3	24.266 Deg C
13	9.0909E 03	MF(+Z-X)	3	24.321 Deg C
14	4.4063E 00	SME(1)TEL	4	4.406 Volts
15	3.0517E-01	SME(2)TEL	4	0.305 Volts
16	-1.0000E 04	SME PR U7	3	ERROR
17	3.9119E 00	SAM1/BMP2	4	3.912 Volts
18	2.8888E 01	EU=+27V	4	28.888 Volts
19	-2.8827E 01	EU=-27V	4	-28.827 Volts

Data Tape Identifier: FID6

Track for Data: 0

Cal Data File Number: 17

Scan Data File Number: 18

Line Scan Data File Number: 19



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Appendix B

Scan Mirror Assembly Acceptance Test Data

Part 12

Test Flow Event J

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TS 32015-004

DATA SHEET 4351
Workmanship Vibration

SMA Designation

F-1

S/N

4

Exposure

Axis	Frequency Range, Hz	Total Time of Sweep (Linear), min	Level, g	QC Stamp
Y	10-2000 Hz	3:49	0.5	
X	10-2000 Hz	3:50	0.5	
Z	10-2000 Hz	3:50	0.5	

Temperature °C	Time @ Specified Temperature	Period	Date	QC Stamp
-10±3°C	14:49:30	2HR 6MIN 33SEC	1-27-81	
(Protoflgh -15±3°C)	16:56:08			
+40±3°C	11:12:48	2HR 1MIN 8SEC(4)	1-28-81	
(Protoflgh +45±3°C)	13:13:56			

Date 3-6-81

QA Stamp



Test Flow Event

TFE-J

Tested by

R. Schreiner

Comments

NOTE - DATA TAKEN FROM TEST ON 1-27-81

NO. RECD 01

ORIGINAL PAGE IS
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HUGHES AIRCRAFT COMPANY

PRODUCT EVALUATION DEPARTMENT

ENVIRONMENTAL LABORATORY

T.R. No. 3908

Date JAN. 27-81

Page 1 of 1

REMOTE DISPLAY CHANNEL NUMBER	TDAS BK./CHAN.	LOCATION
1	2	FRAME INLET
2	3	MIR. INLET
3	4	MIR. OUTLET
4	5	ELECTRONICS
5	7	INLET GAS
6	8	CHAMBER

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Appendix B

Scan Mirror Assembly Acceptance Test Data

Part 13

Test Flow Event K

ORIGINAL PAGE IS
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DATA SHEET 4.3.5-1
OPERATIONAL PERFORMANCE
SCAN TO SCAN REPEATABILITY

TS 32015-004
8 March 1980

SMA Designation: 1 ACCEPT TEST

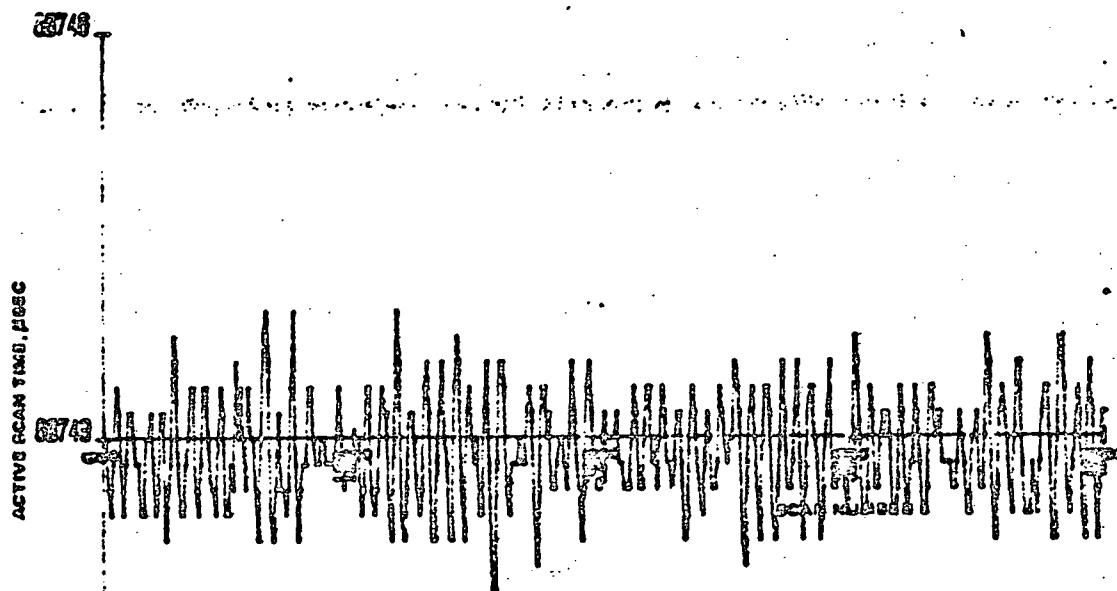
S/N: 4 SMI MODE
SME (1) or (2): 1

Voltage: High ✓ , Nom , Low

31.7 - 31.8 7.0 -

4 3 CONSECUTIVE
(370 FWD, 200 REV)

200 FWD
200 REV



	CLOCK-CORRECTED LINE-LENGTH, μSEC					
	MEAN	SPEC	P/P	ONE-SIGMA	SPEC	P/P
FWD	172.0	173	P	1.3	170 2.9	P
REV	172.2	173	P	1.3	170 2.9	P

Run No. 1120-0140 RS

Test Flow Event R-1 seq 6

Comments test no. 1

QC Stamp

Tested By

Date

3/2/81

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DATA SHEET 4353

TS 32015-004

attach to data sheet 4.3.3-2

400scan parameter: tape H1, rev 1218

OPERATIONAL PERFORMANCE

PARAMETERS

SMA Designation: F-1 ACCEPT TEST

operation: SNE(1) SAM

Serial Number: 4

Test Flow Event: K-1 Seq 5

Run Number: 3-3-8/03

Voltages: 30.7 - 30.6 V

temperatures	T1	T2	T3	T4	T5	T6	T7	T8	T9
	(+2)	(-2)	(+X)	(-X)	(BRDG)	(SAM)	(SME)	(-2-X)	(+2+X)
des C	26.0	24.8	25.3	25.3	25.8	26.9	30.1	24.2	24.2

SCAN PARAMETER (400 scans)	MEASURED	REQUIREMENT	SPECIFICATION	P/F
----------------------------	----------	-------------	---------------	-----

clock freq: HZ	10612940	10612875	+-125	P
----------------	----------	----------	-------	---

torque pulse width: used

mean	770	<1100		P
------	-----	-------	--	---

sigma	15			P
-------	----	--	--	---

turn-around time: used

bumper A: mean	10658.3	10590	+- 68	
----------------	---------	-------	-------	--

sigma	0.1	0.1		P
-------	-----	-----	--	---

bumper B: mean	10536.4			P
----------------	---------	--	--	---

sigma	0.2			P
-------	-----	--	--	---

active scan time: used

fed: min	60741.9			
----------	---------	--	--	--

max	60743.9			
-----	---------	--	--	--

mean	60742.9			
------	---------	--	--	--

sigma	0.4			
-------	-----	--	--	--

rev: min	60741.9			
----------	---------	--	--	--

max	60743.9			
-----	---------	--	--	--

mean	60742.9			
------	---------	--	--	--

sigma	0.4			
-------	-----	--	--	--

combine: mean	60742.9	60743	+-0.2	P
---------------	---------	-------	-------	---

sigma	0.4	<2.9		P
-------	-----	------	--	---

scan period: used	142630.6	142666	+-140	P
-------------------	----------	--------	-------	---

scan rate var: percent

fed: min	-0.002		+-1	P
----------	--------	--	-----	---

max	0.002			P
-----	-------	--	--	---

rev: min	-0.002			P
----------	--------	--	--	---

max	0.002			P
-----	-------	--	--	---

SAM offset(P0 mean): urad	-2.66			
---------------------------	-------	--	--	--

linc start pulse angular

jitter(P0 sigma): urad	0.39	<1.00		P
------------------------	------	-------	--	---

SAM angle: urad

fed: mean	134552			
-----------	--------	--	--	--

sigma	0.31	<1		P
-------	------	----	--	---

rev: mean	134552			P
-----------	--------	--	--	---

sigma	0.35	<1		P
-------	------	----	--	---

Tested by

QA

NO: REQ'D - 22

[illegible]

Page 0100

SNA	F-1 ACCEPT TEST
SERIAL NUMBER	4
RUN NUMBER	1231.011 3
TEST FLOW ERROR	N
TEST NUMBER	1
SEQUENCE NUMBER	6
PRESSURE	1.00E 00 TOFF

INITIALIZE Words Transferred: 4

Word Number 21 INTERRUPT (Row 177771 Ccatal)

Bit	Description	Setting
0	Panel Mode	1
1	Calibrate Mode	0
2	Scan Mode	0

Word Number : 1 PANEL STATUS Row 042402 Oct 01

BIT	Description	Setting
0	Number SW ON	0
1	See SAM P0 P2	1
2	See SAM P2 P5	0
3	See SAM PA PE	0
45	Processed SAM	0
46	Raw SAM	0
47	SAM 1 or SAM 2	0
48	SAM 3 (CAL SAM)	0
49	Single Reset	0
50	End SAM P0/P3	0
51	End SAM P2 P5	1
52	End SAM PD FE	0
53	Ext Reset	1
54	5 Facer	0
55	Calibrate Mode	0
56	Scan Mode	0
57	Auto-Initialize Mode	1
58	Telemetry Mode	0

Word Numbers 2 and 31	Raw 000000	007157 Octal	
Scan Count Preset	7157 Octal	No. of Scans	400
Time Count Preset	0000000	No. of Samples	0

Number of Scales of 38 Dimension	400
Dimension of 38 Array	15226
Dimension of 38 Array	800

CALIFATE: SAN MEI

Rate	Emp Count	Project Area	No. of b
P0P5	0.00	-5.770000E-01	1.6782000E 05
P1P4	0.00	0.0000000E 00	1.6782000E 05
P2P3	0.00	0.0000000E 00	1.6782000E 05

4 - 0,53440

Bunder A1	0.22
Bunder B1	8.00

Temperatures and Voltages

Ch	Scanner	Unit	Device	Col	Measurement
0	1.0000E-04	04	QUADTEMP	5	225.000
1	1.2565E-02	03	EU6-S1	5	225.000
2	1.2565E-02	03	EU6-S2I	5	225.000
3	1.2565E-02	03	EU6-S2I	5	225.000
4	2.0144E-03	03	SMA -Z	1	25.750
5	1.3446E-03	03	SMA -Z	1	25.847
6	1.9291E-03	03	SMA -Z	1	25.805
7	1.3769E-03	03	SMA -Z	1	25.831
8	1.9477E-03	03	TORG-BRDC	1	25.346
9	3.2392E-02	02	SHE TEMP	2	25.764
10	1.8660E-03	03	SAM TEMP	1	30.102
11	7.674E-00	00	EU6-SV	4	26.935
12	9.1034E-03	03	MF(-Z-X)	3	24.152
13	9.1034E-03	03	MF(+Z-X)	3	24.156
14	4.4004E-00	00	SHE-1 TEL	4	4.400
15	3.0733E-01	01	SHE-5 TEL	4	0.307
16	-1.0000E-04	04	SHE PP UT	3	ERROR
17	3.2761E-00	00	SAMI SAMP2	4	3.276
18	3.0681E-01	01	EU6-S2V	4	30.681
19	-3.0561E-01	01	EU6-S2V	4	-30.561

```
IF 'ERROR 20' OCCURS DURING MARKING OF TAPE:
1. Delete REMAP1 ---press execute---press continue
```

Time Tape Identifiers	FID6
Doc for Data	0
Int. Col Data File Number	30
Scat. Data File Number	21
44-38861-Collection: 11/11/1964-AT-FM (1) 1/1/1964-1/1/1980	

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TS 32015-004
8 March 1980

DATA SHEET 4.3.5-1
OPERATIONAL PERFORMANCE
SCAN TO SCAN REPEATABILITY

SMA Designation F-1 ACCEPT TEST

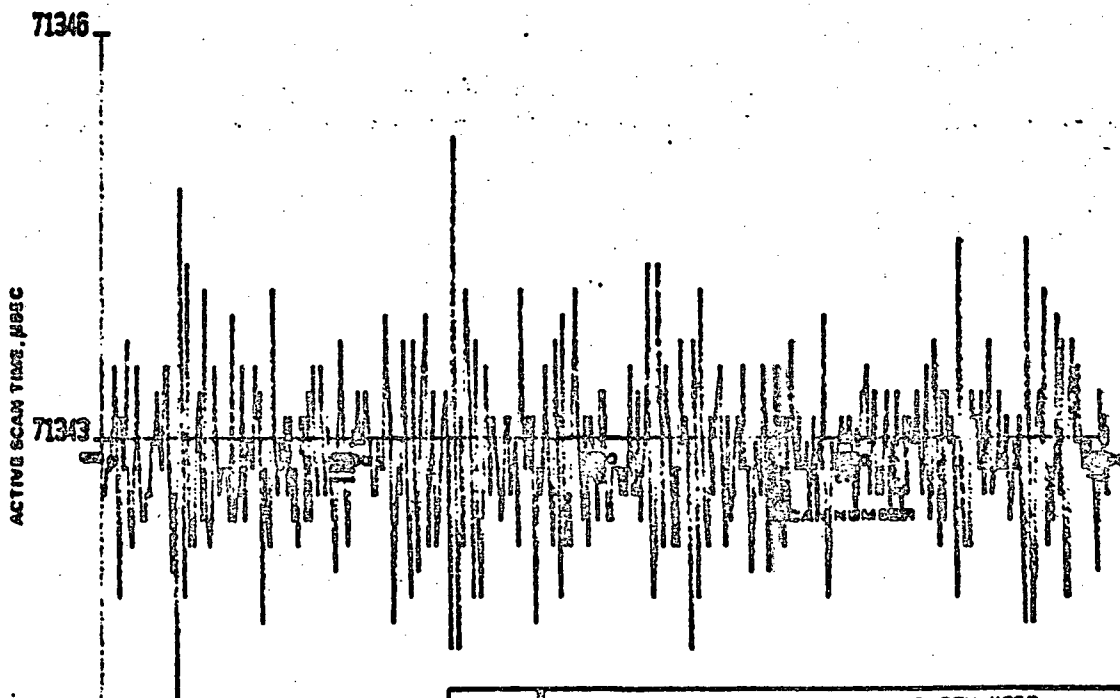
S/N: 4 BURPER MODE 1
SME (1) or (2):

Voltage: High ✓ , Nom , Low

32.7 -32.6 7.6

600 CONSECUTIVE
(200 PWD, 200 REV)

200 PWD
200 REV



	CLOCK-CORRECTED LINE-LENGTH, μ SEC					
	MEAN	SPEC	P/P	ONE-SIGMA	SPEC	P/P
PWD	71342.87	71343 + .8	P	1.5	OTO 2.0	P
REV	71342.89	71343 + .8	P	1.5	OTO 2.0	P

Run No. 11231.813 R

Test Flow Event K-3 eqq 6

Comments test no. 3

QC Stamp Date 3/3/81

Tested By

DATA SHEET 4.163
OPERATIONAL PERFORMANCE
SCAN PARAMETERS

TS 32015-004

Rev 3

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attach to data sheet 4.3.5-2 400scan parameter tape, rev 121830

OPERATIONAL PERFORMANCE
SCAN PARAMETERS

SMA Designation: F-1 ACCEPT TEST (14)
Serial Number: 4
Run Number: 14381-0157-3-2-8/24
temperatures T1 T2 T3 T4 T5 T6 T7 T8 T9
(+2) 26.1 (-2) 24.8 (+X) 25.4 (-X) 25.9 (BRDG) (SME) (-2-X) (+2+X)
dev C 26.1 24.8 25.4 25.9 25.8 27.1 30.6 24.2 24.2

SCAN PARAMETER (400 scans) MEASURED REQUIREMENT SPECIFICATION P/F

clock freq, HZ 10612838 10612875 + -125 P

torque pulse width, usec 857 <1100 P
mean 19

bumper to bumper time, usec
fwd: min 71341.1
max 71345.2
mean 71342.9
sigma 0.6

rev: min 71341.5
max 71344.9
mean 71342.9
sigma 0.6

combined: mean 71342.9
sigma 0.6
scan period, usec 142685.8 142686 + -1.6 71343 + -0.8 <2.9 P P P

scan rate var, percent
fwd: min -0.003
max 0.003
rev: min -0.002
max 0.003

Tested by

QA

NO. REQ'D = 22

4005: a collection of 11 tapeRT-FM, tpe1, t.1e4, rev121880

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Temperatures and Voltages:

Ch	Source	Device	Col	Measurement
4	2.0185E 00	SMA -2	1	24.823 Deg C
12	9.1353E 00	MPK-2-AD	3	24.151 Deg C
13	9.0978E 00	MPK+2+AD	3	24.211 Deg C

Date: 3/3/41 Time: 0157

SMA Destination: F-1 ACCEPT TEST
Serial Number: 4
Run Number: 11281 0157 3-3-5/
Test Flow Event: K
Test Number: 3
Sequence Number: 6
Pressure: 1.10E 00 TORR

INITIALIZE Words Transferred: 4

Word Number 0: INTERRUPT (Raw 177771 Octal)

Bit	Description	Setting
0	Panel Mode	1
1	Calibrate Mode	0
2	Scan Mode	0

Word Number 1: PANEL STATUS (Raw 042402 Octal)

Bit	Description	Setting
0	Bumper SW On	0
1	Bee SAM P0/P3	1
2	Bee SAM P2/P5	0
3	Bee SAM PA/PB	0
45	Processed SAM	1
45	Raw SAM	0
45	SAM 1 or SAM 2	0
45	SAM 3 (CAL SAM)	0
6	Single Reset	0
7	End SAM P0/P3	0
8	End SAM P2/P5	1
9	End SAM PA/PE	0
10	Ext Reset	1
11	5 Facet	0
12	Calibrate Mode	0
13	Scan Mode	0
14	Initialize Mode	1
15	Slow Telemetry Mode	0

Word Numbers 2 and 3: (Raw 000000 007157 Octal)

Scan Count Preset:	7157 Octal	No. of Scans:	400
Time Count Preset:	0000000	No. of Samples:	0

Number of Scans of S# Dimension: 400
Dimension of S# Array: 15226
Dimension of W# Array: 800

CALIBRATE: SAM/SME: 1

Facet	IFAB Counts	Preset Angles	No. a, b
POPS	0.00	-6.7170900E-02	1.6392000E 05
P1P4	1.2926.00	0.0000000E 00	2.4423910E 04
P3P1	2.7840.00	6.7159200E-02	-1.2645352E 01

ORIGINAL PAGE IS
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NUMBER 1: 0.00
NUMBER 2: 0.00

Measurements and Voltages

CH	Scanner Out	Device	Cal	Measurement
1	-1.0100E-04	QUARTER	3	ERROR
2	1.1104E-02	EU=6.81	5	2280.400 mAmps
3	1.5000E-03	EU=+27V	5	30.140 mAmps
4	-1.2730E-03	EU=-27V	5	25.460 mAmps
5	1.0143E-03	SMA -Z	1	24.849 Deg C
6	1.3171E-03	SMA -X	1	25.891 Deg C
7	1.9177E-03	SMA +Z	1	26.108 Deg C
8	1.3759E-03	SMA +X	1	25.359 Deg C
9	1.9450E-03	TORQ BRIG	1	25.794 Deg C
10	0.1149E-02	SME TEMP	2	30.553 Deg C
11	1.8573E-03	SAN TEMP	1	27.059 Deg C
12	7.0414E-00	EU=6.8V	4	7.641 Volts
13	9.1047E-03	MF(-Z-X)	3	24.157 Deg C
14	9.1053E-03	MF(+Z+X)	3	24.152 Deg C
15	4.4135E-00	SME(1)TEL	4	4.410 Volts
16	4.4308E-01	SME(2)TEL	4	0.493 Volts
17	-1.0000E-04	SME PR U7	3	ERROR
18	3.8322E-01	SAN1/BMP2	4	0.260 Volts
19	3.0681E-01	EU=+27V	4	30.681 Volts
20	-3.0561E-01	EU=-27V	4	-30.561 Volts

=====

IF 'ERROR 60' OCCURS DURING MARKING OF TAPE:

type:to REMARK--press execute--press continue

=====

Auto Tape Identifier: F1D6

Track for Data: 0

Initial Data File Number: 22

Scan Data File Number: 23

ORIGINAL PAGE IS
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DATA SHEET 4.3.6-3
OPERATIONAL PERFORMANCE
ALONG SCAN GEOMETRIC REPEATABILITY

TS 32015-004
8 March 1980

SMA Designation F-1 ACCEPT TEST S/N

SAN MODE (and calibrated)
SME (1) or (2) 1

Voltage: High, Norm, Low

IPAR COUNTS:
CALIBRATION

BUMPER A
P2 P3

MID - P1 P4
P0 P6

BUMPER B

SCANNING

K = 8.500004

TEMPS: T1 T2 T3 T4 T5 31.7 31.8 7.0 7.0

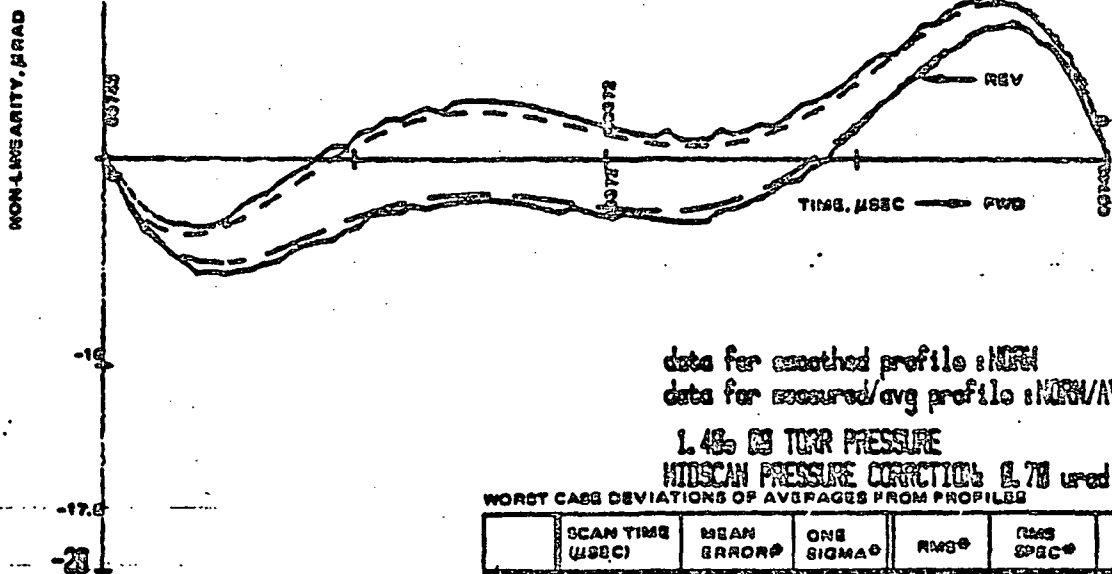
28.3 24.9 25.4 28.8 25.9 27.2 31.4 24.2 24.2

SAN ANGLES
USED (MRAD) -57.171 67.159

MEAN VALUES
P2 2.4 P3 1.4
P1 5.7 P4 1.7
P0 4.4 P6 3.1
LAST P0 4.5

PWD SMOOTHED PROFILE
(FROM TEST) RUN NO. 2771.159
REV SMOOTHED PROFILE
MEASURED AVG. PWD
MEASURED AVG. REV

FWD REV
MIDSCAN OFFSET ANGLES, PHIF, PHIR
slope -3.33 8.62
slope 8.88 8.88
MIDSCAN GRAIND CORRECTION
slope 3.25 8.47



data for smoothed profile: NEW
data for measured/avg profile: NEW/AVG

1.45 03 Torr Pressure

MIDSCAN PRESSURE CORRECTION: 8.70 used

WORST CASE DEVIATIONS OF AVERAGES FROM PROFILES

	SCAN TIME (MSEC)	MEAN ERROR	ONE SIGMA	RMS	RMS SPEC	PTP
FWD	2762.34	-1.55	1.23	1.62		
REV	2874.28	1.48	1.28	1.53	<1.78	P

0 MICRORADIANS

Run No. 1131.8231 3-5-81/18

Test Flow Event K-5 seq 8

QA Stamp Date 3/3/81

Tested By

Comments test no. 5, 19 FWD/19 REV SCAN 75pts each

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TS 32015-004
8 March 1980

DATA SHEET 4.3.6-3
OPERATIONAL PERFORMANCE
ALONG SCAN GEOMETRIC REPEATABILITY

SMA Designation F-1 ACCEPT TEST S/N 4

S/N MODE (and calibrated) deviation profile
S/N (1) or (2) 1 Voltage: High ☒ Nom ☐ Low ☐

IPAR COUNTS:
CALIBRATION

BUMPER A
P2 P3

MID - P1 P4
P0 P6

BUMPER B
SCANNING

MEAN VALUES

P2

P1

P0

5

17.8

15

10

5

0

-5

-10

-15

-20

-25

-30

-35

-40

-45

-50

-55

-60

-65

-70

-75

-80

-85

-90

-95

-100

-105

-110

-115

-120

-125

-130

K - 0.557791

16.37

16.24

1174

2.4

5.7

4.4

LAST P0

1.4

1.7

3.1

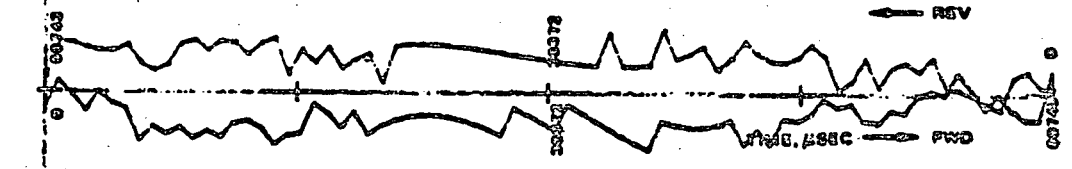
4.5

TEMP: T1 T2 T3 T4 T5 T6 T7 T8 T9 T10
26.3 24.9 25.4 26.6 25.9 27.2 31.4 24.2 26.2
SAM ANGLES USED (MRAD) -67.171 67.159

FWD SMOOTHED PROFILE
(FROM TPE-M RUN NO. 2771.154)
REV SMOOTHED PROFILE
MEASURED AVE, FWD
MEASURED AVE, REV

FWD REV
MIDSCAN OFFSET ANGLES, PHIF, PHIL
mean -1.33 0.02
sigma 0.02 0.02
MIDSCAN GROUND CORRECTION
mean 1.25 0.47

NON-LINEARITY, MRAD



data for smoothed profile: NRM
data for measured/avg profile: NRM/AVG

1.46% 23 TUR PRESSURE
MIDSCAN PRESSURE CORRECTION: 0.70 used

WORST CASE DEVIATIONS OF AVERAGES FROM PROFILES

	SCAN TIME (USEC)	MEAN ERROR	ONE SIGMA	RMS	RMS SPEC	P/P
FWD	779.34	-0.53	1.23	0.02		
REV	8074.26	0.46	0.20	0.53	<1.76	P

Run No. 11391.231 3.3-8/AS

Test Flow Event K-5 seq 8

Comments test no. 5, 19 FEB/19 REV SCAN, 75pts each

QA Stamp

Tested By

Date 11391 3/3/81

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DATA SHEET 4.3.5-4
OPERATIONAL PERFORMANCE
CROSS SCAN REPEATABILITY

TS 32015-004
8 March 1980

SMA Designation F-1 ACCEPT TEST S/N 4 SAM WIDE SME (1) or (2) 1

Voltage: High ☒ , Nom ☐ , Low ☐

32.7 -32.8 7.6

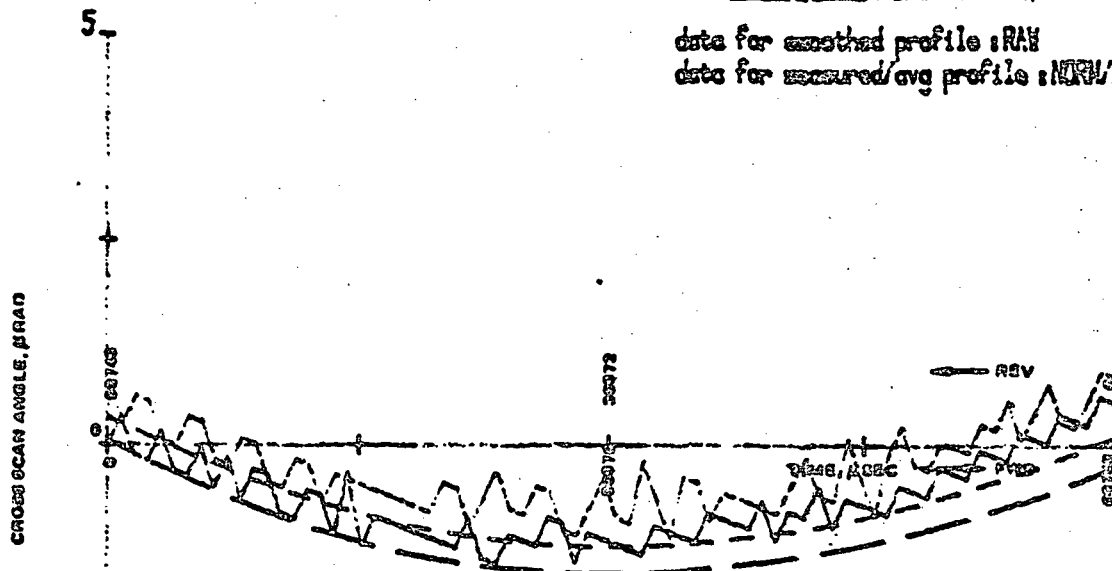
FORWARD LINEAR IPAR-ALIGNMENT
TEAM REMOVED:

95.93 used

(FROM TPE-P RUN NO.)

____ FWD SMOOTHED PROFILE
(FROM TPE-P RUN NO. 771, 1519)
____ REV SMOOTHED PROFILE
____ MEASURED AVG, FWD
____ MEASURED AVG, REV

data for smoothed profile: RAW
data for measured/avg profile: MEAS/AVG



WORST CASE DEVIATIONS OF AVERAGES FROM PROFILES **						
	SCAN TIME (WSEC)	MEAN ERROR*	ONE SIGMA*	RMS*	RMS SPEC*	P/P
FWD	57448.92	0.70	0.45	0.83		P
REV	4845.58	1.07	0.38	1.13	61.0	

PRESSURE:

1.400

* MICRORADIANS
** AFTER REMOVING THE LINEAR
IPAR-ALIGNMENT TEAM THAT WAS REMOVED
FROM THE ORIGINAL PROFILES

Run No. 11331-231 3-3-81

Test Flow Event K-5 seq 8

Comments test no. 5

QA Stamp

Date

11331 3/3/81

Tested By

Collection: 01: tape AT-FM: ark0: file4: rev022781

=====TEST INITIAL CONDITIONS=====

- (1) Fans must be off for at least 20 min.
- (2) Both Lasers must be on at least 45 min
- (3) DTS temp (+Z-X) must be +/-1 deg from (-Z-X)
- (4) Chamber pressure must be less than 2 torr
- (5) Cross axis polarity correct

ORIGINAL PAGE IS
OF POOR QUALITY

=====

Temperatures and Voltages

Ch	Scanner Out	Device	Cal	Measurement
4	2.0154E 03	SMA -Z	1	24.835 Deg C
12	9.1025E 03	MF(-Z-X)	3	24.174 Deg C
13	9.1028E 03	MF(+Z-X)	3	24.172 Deg C

Time: 0231

SMA Designation: F-1 ACCEPT TEST

Serial Number: 4

Run Number: 14381-0221 3-3-81

Test Flow Event: K

Test Number: 5

Sequence Number: 6

INITIALIZE Words Transferred: 4

Word Number 0: INTERRUPT (Raw 177771 Octal)

Bit	Description	Setting
0	Panel Mode	1
1	Calibrate Mode	0
2	Scan Mode	0

Word Number 1: PANEL STATUS (Raw 046402 Octal)

Bit	Description	Setting
0	Bumper SW On	0
1	Beq SAM P0/P3	1
2	Beq SAM P2/P5	0
3	Beq SAM PA/P8	0
45	Processed SAM	1
45	Raw SAM	0
45	SAM 1 or SAM 2	0
45	SAM 3 (CAL SAM)	0
5	Single Reset	0
7	End SAM P0/P3	0
8	End SAM P2/P5	1
9	End SAM PD/PE	0
10	Ext Reset	1
11	5 Facet	1
12	Calibrate Mode	0
13	Scan Mode	0
14	Initialize Mode	-1
15	Slow Telemetry Mode	0

Word Numbers 2 and 3: (Raw 000000 007157 Octal)

Scan Count Preset:	7157 Octal	No. of Scans:	400
Time Count Preset:	0000000	No. of Samples:	0

INITIALIZE Words Transferred: 4

Word Number 0: INTERRUPT (Raw 177771 Octal)

Bit	Description	Setting
0	Panel Mode	1
1	Calibrate Mode	0

ORIGINAL PAGE IS
OF POOR QUALITY

Panel Status (Row 046402 Octal)

Bit	Description	Setting
0	Bumper SN On	0
1	See SAM PD/P3	1
2	See SAM P2/P5	0
3	See SAM PA/PB	0
4	Processed SAM	1
45	Raw SAM	0
46	SAM 1 or SAM 2	0
47	SAM 3 (CAL SAM)	0
5	Single Reset	0
6	End SAM PD/P3	0
7	End SAM P2/P5	1
8	End SAM PD/PE	0
10	Ext Reset	1
11	5 Facet	1
12	Calibrate Mode	0
13	Scan Mode	0
14	Initialize Mode	1
15	Slow Telemetry Mode	0

Word Numbers 2 and 3: (Row 176747 057730 Octal)

Scan Count Preset:	7730 Octal	No. of Scans:	39
Time Count Preset:	3757165	No. of Samples:	75

Number of Scans of S\$ Dimension: 41
 Scans x Samples: 3075
 Number of Samples plus 1: 76
 Dimension of S\$ Array: 14950
 Dimension of W\$ Array: 62

CALIBRATE: SAM/SME: 1
 -----P0P5-----

	Along	Cross	A-Octal-B	
Ave	0.00	0.75	Minutes:	153.38
Sigma	0.00	0.62		

-----BUMPER B-----

	Along	Cross	A-Octal-B	
Ave	-3174.00	-2.00	Minutes:	153.78
Sigma	0.00	0.00		

-----P1P2-----

	Along	Cross	A-Octal-B	
Ave	154324.48	115.01	Minutes:	154.07
Sigma	0.50	0.75		

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-----BUMPER A-----

Along	Cross	A-Octal-B	
Ave 331937.00	240.00	Minutes:	154.48
Stdev 0.00	0.00		

-----P2P3-----

Along	Cross	A-Octal-B	
Ave 328387.00	237.40	Minutes:	154.68
Stdev 0.00	0.52		

-----P0P5-----

Along	Cross	A-Octal-B	
Ave 0.00	-0.16	Minutes:	155.22
Stdev 0.00	0.37		

Along Scan Calibration
Time at end of Cal: 235.13

Facet	IFAR Counts		Preset Angles	No. a, b
P0P5	0.00	-0.16	-6.7170900E-02	1.6422449E 05
P1P4	164224.49	114.44	0.0000000E 00	2.4464660E 06
P2P3	328387.00	237.14	6.7159200E-02	1.4819643E 04

ORIGINAL PAGE IS
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Sumper A: 22.937.00
Sumper B: -3174.00

CROSS SCAN conversion factor: 0.409urad/IFAR count
CROSS AXIS THERM DRIFT RATE: 0.20urad/min
CROSS SCAN linear term desired: 97.07urad

data collection: 2: tape AT-FM: trk 0: file 5: rev 22681

Time at end of SCAN: 236.07 156.13
Time between Cal and Scan: 0.94min
CROSS AXIS DRIFT: (last P0 to SCAN): -0.19urad
CROSS AXIS REFERENCE OFFSET: -0.26urad

Time at end of SCAN: 236.23 156.38
Time between Cal and Scan: 1.10min
CROSS AXIS DRIFT: (last P0 to SCAN): -0.22urad
CROSS AXIS REFERENCE OFFSET: -0.29urad

Chamber Pressure (torr): 1.40

Temperatures and Voltages

Ch	Scanner Out	Device	Cal	Measurement
0	-1.0000E 04	QUARTER	3	ERROR
1	2.2455E-02	EU=6.81	5	2245.500 mAmps
2	1.4750E-03	EU=+271	5	29.500 mAmps
3	-1.2300E-03	EU=-271	5	24.600 mAmps
4	2.0139E 03	SMA -Z	1	24.864 Deg C
5	1.9311E 03	SMA -X	1	26.002 Deg C
6	1.9126E 03	SMA +Z	1	26.266 Deg C
7	1.9703E 03	SMA +X	1	25.437 Deg C
8	1.9366E 03	TORQ BRDG	1	25.923 Deg C
9	7.9201E 02	SME TEMP	2	31.360 Deg C
10	1.8454E 03	SAN TEMP	1	27.230 Deg C
11	7.6435E 00	EU=6.8V	4	7.649 Volts
12	9.1215E 03	MF(-Z-X)	3	24.183 Deg C
13	9.1016E 03	MF(+Z+X)	3	24.182 Deg C
14	4.4094E 00	SME(1)TEL	4	4.409 Volts
15	0.0727E-01	SME(2)TEL	4	0.307 Volts
16	-1.0000E 04	SME PR U7	3	ERROR
17	3.9382E 00	SAM1/BMP2	4	3.938 Volts
18	3.0681E 01	EU=+27V	4	30.681 Volts
19	-3.0561E 01	EU=-27V	4	-30.561 Volts

Data Type: 1: Identifier: FID6
Track for Data: 0
Initial Data File Number: 38
Scan Data File Number: 29

ORIGINAL PAGE IS
OF POOR QUALITY

IF 'ERROR' 48 OCCURS DURING MARKING OF TAPE:
type:to PEMBL---press, execute---press continue
=====

* track 0 is full use track 1
if track 0 and 1 full mark new tape
TO MARK A TRACK:
(1) NEVER PRESS 'RUN' OR ALL DATA LOST
(2) REWIND TAPE FOR DATA STORAGE
(3) TYPE IN EMPTY TRACK NO.--EXECUTE
(4) wrk 1,20--EXECUTE
(5) INSERT AT TAPE--eto'A'

Data Tape Identifier:	F1D6
Track for Data:	1
Init/Cul Data File Number:	1
Scan Data File Number:	2
Norm-Ave Scan Data File Number:	3

TELEMETRY PRINTOUT.1: tapeAT-F:trk0,file15,rev22381

ORIGINAL PAGE IS
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Date: 011111 Time: 0231

SAR Description: F-1 ACCEPT TEST
 Serial Number: 4
 Run Number: 14001.0001 **3-3-81**
 Test Flow Event: F
 Test Number: 5
 Sequence Number: 6

data track identifier: FID6
 track for data: 1
 INIT/CAL data file number: 1
 SCAN data file number: 2
 NORM AVG SCAN data file number: 3
 Smoothing Coeffs file number: 0

mode selected: NORM AVG

TELEMETRY PRINTOUT.2: tapeAT-F:trk0,file16,rev22381

Data Date: **3-3-81** Data Time: 0231

SAR MODE operation

scan N: 1 no. of words transferred = 187

Line Length-N-1: 377 060 015 000
 Drive Scan Time-N-1: 60743.00
 Final Time-N: 60743.30

TELEMETRY

Byte No	Name	Contents	Pulses	Time(used)
1	SYNC	200		
2	OPSTAT N	006	Bit 7 = 0: Scan N= Forward	
3	SCHLIN N	130	88	16.58
4	TRNERR N	003 314	972	183.17
6	TORPLS N	360 142	-3998	-753.42
8	SHSERR N-1	377 353	-13	-2.45
10	PHSERR N-1	000 015	13	2.45
12	SUNERR N-1	377 360 142	-3998	-753.42
15	SCHCTR	000 327		
17	SCHLIN N-1	250	-88	-16.58
18	TRNERR N-1	001 075	317	59.74
20	TORPLS N-1	357 272	-4166	-785.08
22	SHSERR N-1	000 025	21	3.96
24	PHSERR N-2	377 353	-21	-3.96
26	SUNERR N-2	377 357 272	-4166	-785.08
29	SCNTYN N-2	004 353 031	322329	60743.01
32	NSCANS	332	No.Scans =	218 (decimal)

scan N: 2 no. of words transferred = 182

Line Length-N-1: 001 187 353 377
 Drive Scan Time-N-1: 60743.00
 Final Time-N: 60743.67

TELEMETRY

Byte No	Name	Contents	Pulses	Time(used)
1	SYNC	200		
2	OPSTAT N	206	Bit 7 = 1: Scan N= Reverse	
3	SCHLIN N	150	-88	-16.58

ORIGINAL PAGE IS
OF POOR QUALITY

Line	Length	N-1	001	117	353	377	Pulses	Time(used)
10	11	PHSERR	N-1	000	025		-4166	-785.03
11	14	SCHNTR	N-1	000	025		31	3.96
12	14	SCHNTR	N-1	000	025		-21	-3.96
13	14	SCHNTR	N-1	000	025	272	-4166	-785.08
14	16	SCHNTR	N-1	000	030			
15	17	SCHNTR	N-1	130			98	16.58
16	19	TRNERR	N-1	003	314		972	183.17
17	21	TOPPLS	N-1	360	142		-3998	-753.42
18	23	SHSERR	N-2	377	363		-13	-2.45
19	25	PHSERR	N-2	000	015		13	2.45
20	27	SUMERR	N-2	377	360	142	-3998	-753.42
21	30	SCHNTR	N-2	004	353	031	322329	60743.01
22	32	NSCANS		037			No.Scans =	31 (decimal)

Line N: 39 no. of words transferred = 182

Line Length: N-1: 001 117 353 377

Active Scan Time: N-1: 60743.19

Final Time: N: 60743.30

TELEMETRY

Byte No	Name	Contents	Pulses	Time(used)
1	SYNC	200		
2	OPSTAT	N 206	Bit 7 = 1: Scan N= Reverse	
3	SCHNTR	N 250	-98	-16.58
4	TRNERR	N 001 076	318	59.93
5	TOPPLS	N 357 267	-4169	-785.65
6	SHSERR	N-1 000 024	20	3.77
7	PHSERR	N-1 377 353	-21	-3.96
8	SUMERR	N-1 377 357 271	-4167	-785.27
9	SCHNTR	000 352		
10	SCHNTR	N-1 130	88	16.58
11	TRNERR	N-1 003 315	973	183.36
12	TOPPLS	N-1 360 141	-3999	-753.61
13	SHSERR	N-2 377 362	-14	-2.64
14	PHSERR	N-2 000 016	14	2.64
15	SUMERR	N-2 377 360 141	-3999	-753.61
16	SCHNTR	N-2 004 353 031	322329	60743.01
17	NSCANS	037	No.Scans =	31 (decimal)

scan N: 39 no. of words transferred = 181

Line Length: N-1: 377 040 016 000

Active Scan Time: N-1: 60743.00

Final Time: N: 60743.11

TELEMETRY

Byte No	Name	Contents	Pulses	Time(used)
1	SYNC	200		
2	OPSTAT	N 006	Bit 7 = 0: Scan N= Forward	
3	SCHNTR	N 130	88	16.58
4	TRNERR	N 003 314	972	183.17
5	TOPPLS	N 363 140	-4000	-753.80
6	SHSERR	N-1 377 362	-14	-2.64
7	PHSERR	N-1 000 016	14	2.64
8	SUMERR	N-1 377 360 140	-4000	-753.80
9	SCHNTR	000 352		
10	SCHNTR	N-1 250	-88	-16.58
11	TRNERR	N-1 001 076	318	59.93
12	TOPPLS	N-1 357 267	-4169	-785.65
13	SHSERR	N-2 000 024	20	3.77
14	PHSERR	N-2 377 353	-21	-3.96
15	SUMERR	N-2 377 357 271	-4167	-785.27
16	SCHNTR	N-2 004 353 032	322330	60743.20
17	NSCANS	037	No.Scans =	31 (decimal)

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DATA SHEET 4.3.5-1
OPERATIONAL PERFORMANCE
SCAN TO SCAN REPEATABILITY

TS 32015-004
8 March 1980

15:

SMA Designation F-1 ACCEPT TEST

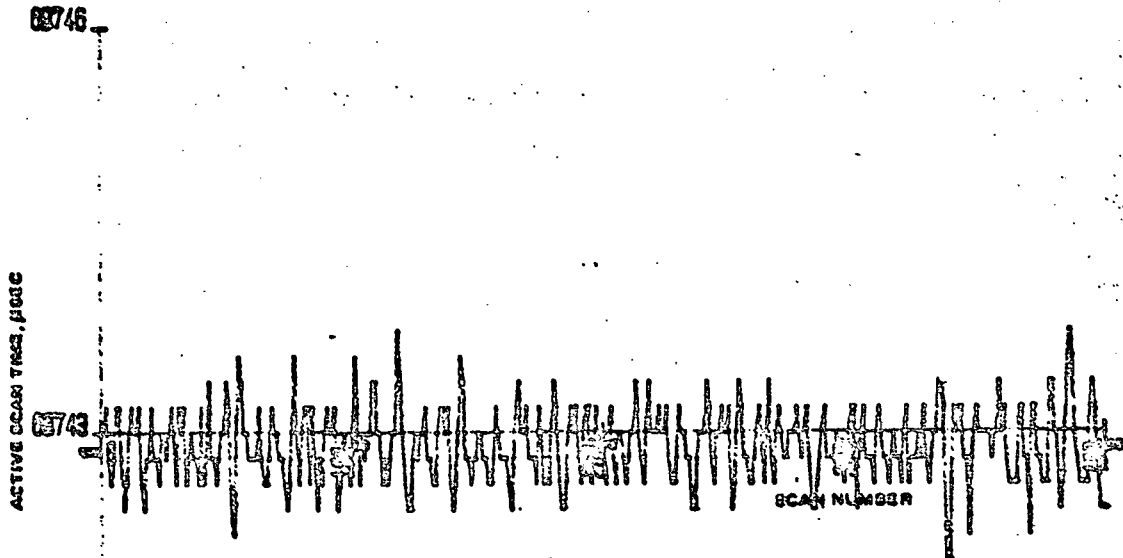
S/N: 4 SAW 100E
SME (1) or (2): 2

Voltage: High , Nom , Low

32.7 -31.6 7.6 -

400 CONSECUTIVE
(200 FWD, 200 REV)

200 FWD
200 REV



	CLOCK-CORRECTED LINE-LENGTH, μ SEC					
	MEAN	SPEC	P/P	ONE SIGMA	SPEC	P/P
FWD	00742.91	00743	P	0.25	0 TO 2.0	P
REV	00742.91	00743	P	0.27	0 TO 2.0	P

Run No. 1131 3-3-81/18
Test Flow Event K-8 seq 8
Comments test no 8

QC Stamp Date 3/3/81
Tested By

.. ORIGINAL PAGE IS
OF POOR QUALITY

DATA SHEET 4152
OPERATIONAL PERFORMANCE

TS 32015-004

Rev 3

attach to data sheet 4152

012188

OPERATIONAL PERFORMANCE
SCAN PARAMETERS

SMA Designation: F-1 ACCEPT TEST

Serial Number: 4

Run Number: 11201.0206

temperatures T1

T2

T3

T4

T5

T6

T7

T8

T9

deg C

(+Z)

(-Z)

(+X)

(-X)

(BRDG)

(SAM)

(SME)

(-Z-X)

(+Z-X)

deg C

26.2

24.9

25.4

25.9

25.8

27.0

30.5

24.2

24.2

operation: SME(2) SAM

Test Flow Event: K-8 Sea 6

Voltages: 30.7 -30.6 7.0

SCAN PARAMETER (400 scans)

MEASURED

REQUIREMENT

SPECIFICATION

P/F

clock freq, HZ

7

10612875 +-125

torque pulse width, usec

mean

768

<1100

sigma

15

turn-around time, usec

10590 +- 68

bumper A: mean

10653.3

sigma

0.1

bumper B: mean

10526.4

sigma

0.1

active scan time, usec

fwd: min

60742.1

max

60743.9

mean

60742.9

sigma

0.3

rev: min

60742.1

max

60743.6

mean

60742.9

sigma

0.3

combine: mean

60742.9

sigma

0.3

60743 +-0.2

<2.9

scan period, usec

142665.5

142666 +-140

scan rate var, percent

+-1

fwd: min

-0.001

max

0.001

rev: min

-0.001

max

0.001

SAM offset(P0 mean), urad

-1.60

line start pulse angular

jitter(P0 sigma), urad

0.22

<1.00

SAM angle, urad

fwd: mean

134581

sigma

0.26

<1

rev: mean

134580

sigma

0.27

<1

Tested by

QA

NO. REQ'D = 22

Tennessee: 1962-1963

Date: 3/2/82 Time: 0200

SNR 20110101001 F-1 ACCEPT TEST

Serial Number: 4

File Number: 100-1022 3-3-81

T-22: FLO: E-14798 1
T-22: FLO: E-14798 2

1944-1945	1946-1947	1948-1949	1950-1951	1952-1953	1954-1955	1956-1957	1958-1959	1960-1961	1962-1963	1964-1965	1966-1967	1968-1969	1970-1971	1972-1973	1974-1975	1976-1977	1978-1979	1980-1981	1982-1983	1984-1985	1986-1987	1988-1989	1990-1991	1992-1993	1994-1995	1996-1997	1998-1999	2000-2001	2002-2003	2004-2005	2006-2007	2008-2009	2010-2011	2012-2013	2014-2015	2016-2017	2018-2019	2020-2021	2022-2023	2024-2025	2026-2027	2028-2029	2030-2031	2032-2033	2034-2035	2036-2037	2038-2039	2040-2041	2042-2043	2044-2045	2046-2047	2048-2049	2050-2051	2052-2053	2054-2055	2056-2057	2058-2059	2060-2061	2062-2063	2064-2065	2066-2067	2068-2069	2070-2071	2072-2073	2074-2075	2076-2077	2078-2079	2080-2081	2082-2083	2084-2085	2086-2087	2088-2089	2090-2091	2092-2093	2094-2095	2096-2097	2098-2099	2100-2101	2102-2103	2104-2105	2106-2107	2108-2109	2110-2111	2112-2113	2114-2115	2116-2117	2118-2119	2120-2121	2122-2123	2124-2125	2126-2127	2128-2129	2130-2131	2132-2133	2134-2135	2136-2137	2138-2139	2140-2141	2142-2143	2144-2145	2146-2147	2148-2149	2150-2151	2152-2153	2154-2155	2156-2157	2158-2159	2160-2161	2162-2163	2164-2165	2166-2167	2168-2169	2170-2171	2172-2173	2174-2175	2176-2177	2178-2179	2180-2181	2182-2183	2184-2185	2186-2187	2188-2189	2190-2191	2192-2193	2194-2195	2196-2197	2198-2199	2200-2201	2202-2203	2204-2205	2206-2207	2208-2209	2210-2211	2212-2213	2214-2215	2216-2217	2218-2219	2220-2221	2222-2223	2224-2225	2226-2227	2228-2229	2230-2231	2232-2233	2234-2235	2236-2237	2238-2239	2240-2241	2242-2243	2244-2245	2246-2247	2248-2249	2250-2251	2252-2253	2254-2255	2256-2257	2258-2259	2260-2261	2262-2263	2264-2265	2266-2267	2268-2269	2270-2271	2272-2273	2274-2275	2276-2277	2278-2279	2280-2281	2282-2283	2284-2285	2286-2287	2288-2289	2290-2291	2292-2293	2294-2295	2296-2297	2298-2299	2300-2301	2302-2303	2304-2305	2306-2307	2308-2309	2310-2311	2312-2313	2314-2315	2316-2317	2318-2319	2320-2321	2322-2323	2324-2325	2326-2327	2328-2329	2330-2331	2332-2333	2334-2335	2336-2337	2338-2339	2340-2341	2342-2343	2344-2345	2346-2347	2348-2349	2350-2351	2352-2353	2354-2355	2356-2357	2358-2359	2360-2361	2362-2363	2364-2365	2366-2367	2368-2369	2370-2371	2372-2373	2374-2375	2376-2377	2378-2379	2380-2381	2382-2383	2384-2385	2386-2387	2388-2389	2390-2391	2392-2393	2394-2395	2396-2397	2398-2399	2400-2401	2402-2403	2404-2405	2406-2407	2408-2409	2410-2411	2412-2413	2414-2415	2416-2417	2418-2419	2420-2421	2422-2423	2424-2425	2426-2427	2428-2429	2430-2431	2432-2433	2434-2435	2436-2437	2438-2439	2440-2441	2442-2443	2444-2445	2446-2447	2448-2449	2450-2451	2452-2453	2454-2455	2456-2457	2458-2459	2460-2461	2462-2463	2464-2465	2466-2467	2468-2469	2470-2471	2472-2473	2474-2475	2476-2477	2478-2479	2480-2481	2482-2483	2484-2485	2486-2487	2488-
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```

SEQUENCE NUMBER: 8
PRINTER: 1.15E 00 TOPP

```

INITIALS Words Transferred: 4

Word Number 31 INTERRUPT (Row 137771 Octal)

Bit	Description	Setting
0	Panel Mode	1
1	Calibrate Mode	0
2	Scan Mode	0

Word Number : PANEL STATUS (Row 042402 Octal)

Bit	Description	Setting
0	Bumper SW On	0
1	See SAM P0/P3	1
2	See SAM P2/P5	0
3	See SAM PA/PB	0
45	Processed SAM	1
45	Raw SAM	0
45	SAM 1 or SAM 2	0
45	SAM 3 (CAL SAM)	0
6	Single Reset	0
7	End SAM P0/P3	0
8	End SAM P2/P5	1
9	End SAM PD FE	0
10	Ext Reset	1
11	5 Facet	0
12	Calibrate Mode	0
13	Scan Mode	0
14	Initialize Mode	1
5	Slew Telemetry Mode	0

Word Numbers 2 and 3: Paw 000000 007157 Octol
Scan Count Presets: 7157 Octol No. of Scans: 400
Time Count Presets: 000000 No. of Samples: 0

Number of Scans of SR Dimension: 400
Dimension of SR Array: 15226
Distribution of SR Array: 300

7 PRIORITY: 301. ONE: 2

FOCUS	DATE	TIME	NAME	STATUS
P001	01/01/01	00:00	00000000000000000000	00
P002	01/01/01	00:00	00000000000000000000	00
P003	01/01/01	00:00	00000000000000000000	00

K = 0.500000

Bumper A: 0.00
Bumper B: 0.00

Temperatures and Voltages

Ch	Scanner Out	Device	Col	Measurement
0	1.0000E-04	QUARTER	3	ERROR
1	1.2547E-02	EU=6.81	5	2254.508 mVrms
2	1.4480E-03	EU=+27V	5	28.360 mVrms
3	1.2330E-03	EU=-27V	5	24.650 mVrms
4	2.0037E-03	SMA -Z	1	24.874 Dec C
5	1.9261E-03	SMA -X	1	23.501 Dec C
6	1.9293E-03	SMA +Z	1	23.501 Dec C
7	1.9724E-03	SMA +X	1	23.395 Dec C
8	1.9431E-03	TORQ BRDC	1	25.329 Dec C
9	8.1311E-02	SHE TEMP	2	30.928 Dec C
10	1.8548E-03	SAM TEMP	2	26.955 Dec C
11	1.6395E-00	EU=6.8V	4	7.639 Volts
12	2.1038E-03	MF(-Z-X)	3	24.164 Dec C
13	2.1044E-03	MF(+Z+X)	3	24.160 Dec C
14	5.1955E-01	SHE(1) TEL	4	0.320 Volts
15	4.4112E-00	SHE(2) TEL	4	4.421 Volts
16	1.0000E-04	SHE PP UT	3	ERROR
17	2.6748E-01	SAM1 BHP2	0	0.260 Volts
18	3.0681E-01	EU=+27V	4	30.681 Volts
19	3.0561E-01	EU=-27V	4	30.561 Volts

IF 'EFP0P 60' OCCURS DURING MARKING OF TAPE:
 tape:90 PEPARK--press execute--press continue

Data Type Identifier	FID#
Tree, for Data	0
Initial Core File Number	24
Scan Core File Number	25

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DATA SHEET 4.3.5-1
OPERATIONAL PERFORMANCE
SCAN TO SCAN REPEATABILITY

TS 32015-004
8 March 1980

SMA Designation F-1 ACCEPT TEST

S/N: 4 ELPER KITE
SME (1) or (2): 2

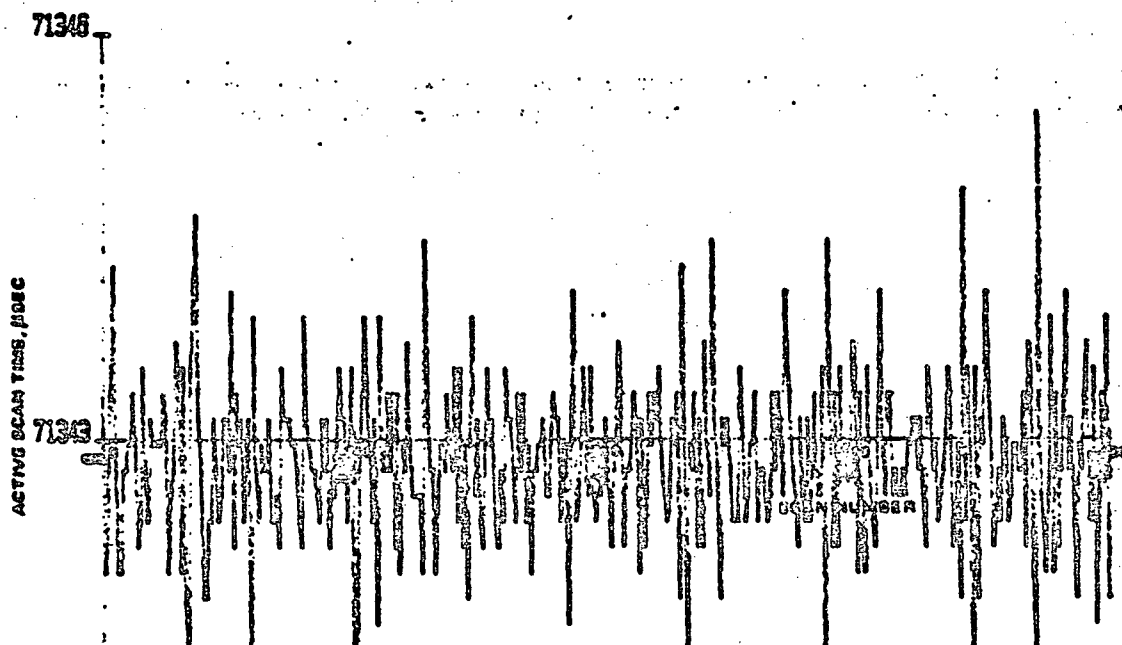
Voltage: High ✓, Nom , Low

3.7 -3.8 7.6

400 CONSECUTIVE
(200 PWD, 200 REV)

200 PWD

200 REV



	CLOCK-CORRECTED LINE-LENGTH, μ SEC					
	MEAN	SPC	P/P	ONE-SIGMA	SPC	P/P
PWD	71342.87	71343	P	1.53	0 TO 2.0	P
REV	71342.88	71343	P	1.61	0 TO 2.0	P

Run No. 11381 822 3-3-81 13

Test Flow Event K-18 seq 8

Comments test as 18

QC Stamp Date 3/3/81

Tested By

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DATA SHEET 4.1.8.2

TS 32015-004

OPERATIONAL PERFORMANCE
SCAN PARAMETERS

Rev 9

attach to data sheet 4.3.5-2 400scan parameter, tape AT, rev 121680

OPERATIONAL PERFORMANCE
SCAN PARAMETERS

SMA Designation: F-1 ACCEPT TEST
Serial Number: 4
Run Number: 41381-0252-3-3-8/28
operation: SNE(2) BUMPER
Test Flow Event: K-10 Seq 6
Voltages: 30.7 -30.6 7.6
temperatures T1 T2 T3 T4 T5 T6 T7 T8 T9
(+Z) 26.2 24.9 25.4 25.9 (-X) (-X) (BRDG) (SME) (-Z-X) (+Z+X)
dev C 26.2 24.9 25.4 25.9 25.9 27.0 30.9 24.2 24.2

SCAN PARAMETER(400 scans) MEASURED REQUIREMENT SPECIFICATION P/F

clock freq, HZ 7 10612875 +-125 *see data sheet* X P

torque pulse width, usec 853
mean 52
sigma

bumper to bumper time, usec

fwd: min 71341.1
max 71345.4
mean 71342.9
sigma 0.6

rev: min 71341.1
max 71344.7
mean 71342.9
sigma 0.6

combine: mean 71342.9
sigma 0.6

scan period, usec 142685.7

scan rate var, percent
fwd: min -0.003
max 0.004
rev: min -0.003
max 0.003

71343 +-0.8 P
<2.9 P P

142686 +-1.6

Tested by

QA

ED. REQ'D = 22

AT

Ch	Device	Col	Measurement
4	IMA = 0	1	24.833 Deg C
12	MF = 0	3	24.178 Deg C
13	MF = 0	3	24.825 Deg C

SMA Designations: F-1 ACCEPT TEST
Serial Numbers: 4
Part Numbers: 1-221-0000 3-3-81 88
Test Flow Events: K
Test Numbers: 10
Sequence Numbers: 5
Pressures: 1.25E 08 TOFF

Est	Description	Setting
0	Panel Mode	1
1	Calibrate Mode	0
2	Scan Mode	0

Bit	Description	Setting
0	Bumper SW On	0
1	Beep SAM P0/P3	1
2	Beep SAM P2/P5	0
3	Beep SAM PA/PB	0
4,5	Processed SAM	1
4,5	Pos SAM	0
4,5	SAM 1 or SAM 2	0
4,5	SAM 3 (CARL SAM)	0
6	Simple Reset	0
7	End SAM P0/P3	0
8	End SAM P2/P5	1
9	End SAM PD-FE	0
10	Ext Reset	1
11	3 Facet	0
12	Calibrate Mode	0
13	Scan Mode	0
14	Initialize Mode	1
15	Slip Telemetry Mode	0

Number of Scans of S8 Dimensions: 400
Dimension of S8 Array: 15226
Dimension of W8 Array: 800

F011	IFAF Count	F4141	Pos141	N=2.0
P055	0.00	-0.715000E-01	1.529200E 01	
P151	1.0210.00	0.000000E 00	1.441180E 01	
P2F3	3.02140.00	0.715000E-01	-3.4095374E 04	

```

K = 0.500000
Bumper A: 0.00
Bumper B: 0.00

```

Ch	Scan	Device	Val	Measurement
0	-1.0000E-01	QUAFER	0	EPICR
1	-1.3022E-01	EUW=81	0	2382.200 AAAA
2	-1.4520E-03	EUW=27	0	29.750 AAAA
3	-1.2520E-03	EUW=27	0	25.060 AAAA
4	-2.0132E-03	SMA -X	1	24.359 Deg C
5	-1.9272E-03	SMA -Y	1	25.915 Deg C
6	-1.9133E-03	SMA -Z	1	26.173 Deg C
7	-1.9722E-03	SMA -X	1	25.404 Deg C
8	-1.9400E-03	TORQ BRDG	1	25.874 Deg C
9	-3.0449E-02	SHE TEMP	2	30.863 Deg C
10	-1.8627E-05	SAM TEMP	1	36.932 Deg C
11	-7.6398E-00	EUW=0V	4	7.640 Volts
12	-9.1026E-03	MF1-Z(X)	3	24.174 Deg C
13	-9.1019E-03	MF1-Z(X)	3	24.130 Deg C
14	-3.2220E-01	SME(1)-TEL	4	0.323 Volts
15	-4.4216E-01	SME(2)-TEL	4	4.422 Volts
16	-1.0000E-04	SME FR U2	3	ERROR
17	-2.9462E-00	SAM1 BRP	4	3.940 Volts
18	-3.0631E-01	EUW=27V	4	30.631 Volts
19	-2.0051E-01	EUW=27V	4	-30.551 Volts

```

*****
IF 'EFROP 20' OCCURS DURING MARKING OF TAPE:
  100. 70 PEMAPK---press execute---press continue
*****

```

Gold Tape Identifiers	FID6
Prod. or Date	0
Inst. Coll. Date File Numbers	25
Spec. Date File Numbers	27

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OF POOR QUALITY

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TS 32015-004
8 March 1980

DATA SHEET 4.3.6-3
OPERATIONAL PERFORMANCE
ALONG SCAN GEOMETRIC REPEATABILITY

SAN MODE (and calibrated)
SME (1) or (2) 2

Voltage: High ☒ , Nom ☐ , Low ☐

SMA Designation F-1 ACCEPT TEST 5/14

IFAR COUNTS:
CALIBRATION

BUMPER A

P2 P3

MID - P1 P4

P0 P5

BUMPER B

SCANNING

K = 0.500000

TEMPS: T1 T2 T3 T4 T5 T6 T7 T8 T9

28.3 24.9 25.5 28.6 28.8 27.8 31.1 24.2 24.2

SAN ANGLES
USED (MRAD) -67.182 67.168

MEAN
VALUES

P2

P1

P0

28

17.8

16

15

14

13

12

11

10

9

8

7

6

5

4

3

2

1

0

-1

-2

-3

-4

-5

-6

-7

-8

-9

-10

-11

-12

-13

-14

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-36

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SAN OFFSETS, MRAD

P2

P1

P0

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17.8

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P3

P4

P5

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17.8

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P3

P4

P5

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P3

P4

P5

28

17.8

ORIGINAL PAGE IS
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TS 32015-004
8 March 1980

DATA SHEET 4.3.5.3
OPERATIONAL PERFORMANCE
ALONG SCAN GEOMETRIC REPEATABILITY

SMA Designation F-1 ACCEPT TEST S/N 4

SAN MODE (and calibrated) deviation profile
SHE (1) or (2) 2 Voltage: High 31.7, Nom 31.8, Low 7.8

IPAR COUNTS:
CALIBRATION

BUMPER A

P2 P3

MID - P1 P4

P0 P5

BUMPER B

SCANNING

MEAN
VALUES

P2

P3

P1

P4

P0

P5

LAST P0

2.9

2.8

2.8

2.8

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TEMP: T1

T2

T3

T4

T5

T6

T7

T8

T9

T10

28.3

24.9

25.5

28.8

28.8

27.8

31.1

24.2

24.2

SAN ANGLES

USED (MRAD)

-57.182

57.182

PWD SMOOTHED PROFILE
(FROM TPE-4 RUN NO. 2771.100)
REV SMOOTHED PROFILE
MEASURED AVE. PWD
MEASURED AVE. REV

PWD REV
WIDSCAN OFFSET ANGLES, PHIF, PHIF
mean 4.87 8.68
slope 2.83 2.83
WIDSCAN GROUND CORRECTION
mean 1.68 -2.14

NON-LINEARITY, MRAD

5

17.8

10

10

10

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10

data for smoothed profile: N/A
data for measured/avg profile: N/A/AVG

1.5% IN TON PRESSURE

WIDSCAN PRESSURE CORRECTION: 2.75 used

WORST CASE DEVIATIONS OF AVERAGES FROM PROFILES

	SCAN TIME (USEC)	MEAN ERROR	ONE SIGMA	RMS	RMS SPEC	P/P
PWD	2007.13	-1.28	2.33	1.28		
REV	6628.47	-2.51	4.42	2.65	<1.70	P

0 MICROGRADIANS

Run No. 11231.8-3-3-8/13

Test Flow Event K-12 eq 8

Comments test no. 12.19 PWD/19 REV SCAN 75 data each

QA Stamp

Tested By

Date 11/30

3/3/81

ORIGINAL PAGE 19
OF POOR QUALITY

DATA SHEET 4.3.54
OPERATIONAL PERFORMANCE
CROSS SCAN REPEATABILITY

TS 32015-004
8 March 1980

16

SMA Designation **F-1 ACCEPT TEST** S/N **4** SAN **WESME (1) or (2)** **2**

Volts: High ✓ Nom Low

32.7 -32.6 7.8

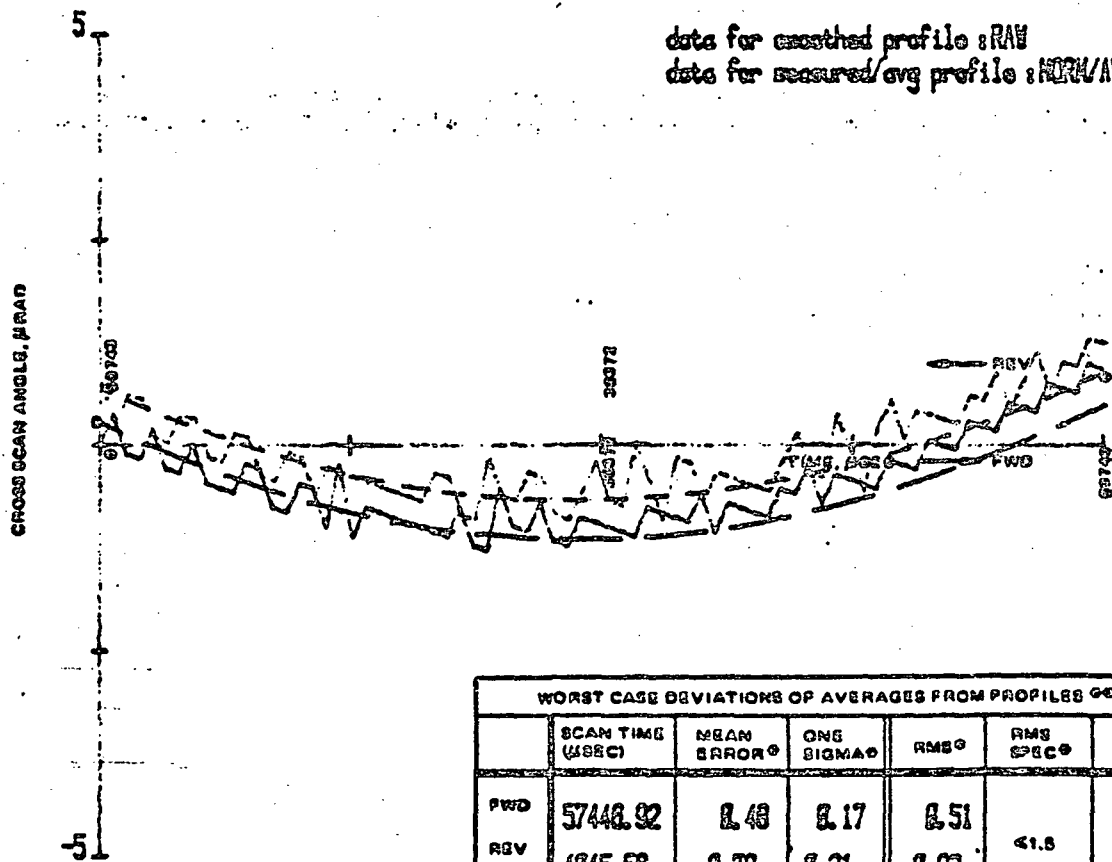
FORWARD LINEAR IFAR-ALIGNMENT
TERM REMOVED:

98.53 unrad

(FROM TFS-P RUN NO.)

— FWD SMOOTHED PROFILE
(FROM TFS-P RUN NO. 100)
— REV SMOOTHED PROFILE
— MEASURED AVG. FWD
— MEASURED AVG. REV

date for smoothed profile: **RAW**
date for measured avg profile: **RAW/AVG**



WORST CASE DEVIATIONS OF AVERAGES FROM PROFILES **						
	SCAN TIME (USEC)	MEAN ERROR*	ONE SIGMA*	RMS*	RMS SEC*	P/P
FWD	57448.92	0.48	0.17	0.51		
REV	4845.58	0.79	0.21	0.82	<1.5	P

* MICRORADIANS
** AFTER REMOVING THE LINEAR
IFAR-ALIGNMENT TERM THAT WAS REMOVED
FROM THE ORIGINAL PROFILE

PRESSURE:

1.520 03

Run No. **11381 0248 3-3 8/18**
Test Flow Event **K-12 seq 8**
Comments **test no 12**

GA Stamp Date **11381 3/3/81**
Tested By

=====

===== INITIAL CONDITIONS =====

- (1) Fans must be off for at least 30 min.
- (2) Both Loops must be on at least 45 min.
- (3) DTS temp (+Z-X) must be +/- 1 deg from (-Z-X)
- (4) Chamber pressure must be less than 2 torr
- (5) Cross axis polarity correct

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OF POOR QUALITY

=====

Temperatures and Voltages

Ch.	Scanner Out	Device	Cal	Measurement
4	3.0551E 01	SMA -Z	1	ERROR
12	9.1808E 03	MF(-Z-X)	3	24.187 Deg C
13	9.1811E 03	MF(+Z-X)	3	24.186 Deg C

Date: 3/3/81 Time: 0249

SMA Designation: F-1 ACCEPT TEST

Serial Number: 4

Run Number: 41381 0249 3-3-81 RB

Test Flow Event: K

Test Number: 12

Sequence Number: 6

INITIALIZE

Words Transferred: 4

Word Number 0: INTERRUPT (Raw 177771 Octal)

Bit	Description	Setting
0	Panel Mode	1
1	Calibrate Mode	0
2	Scan Mode	0

Word Number 1: PANEL STATUS (Raw 046402 Octal)

Bit	Description	Setting
0	Bumper SW On	0
1	See SAM P0/P3	1
2	See SAM P2/P5	0
3	See SAM PA/PB	0
4	Processed SAM	1
5	Raw SAM	0
6	SAM 1 or SAM 2	0
7	SAM 3 (CAL SAM)	0
8	Single Reset	0
9	End SAM P0/P3	0
10	End SAM P2/P5	1
11	End SAM PD/PE	0
12	Ext Reset	1
13	5 Facet	1
14	Calibrate Mode	0
15	Scan Mode	0
16	Initialize Mode	1
17	Slow Telemetry Mode	0

Word Numbers 2 and 3: (Raw 176747 057730 Octal)

Scan Count Preset:	7730 Octal	No. of Scans:	39
Time Count Preset:	3757165	No. of Samples:	75

Number of Scans of 32 Dimension: 41

Scans x Samples: 3075

Number of Samples plus 1: 76

Dimension of 32 Array: 14950

Dimension of 32 Array: 82

CALIBRATION: 1-1-1985

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Along	Cross	A-Octal-B	Minutes
Avg 0.39	-0.35		169.97
Sigma 0.49	0.48		

-----BUMPER B-----

Along	Cross	A-Octal-B	Minutes
Avg -3148.18	-4.30		170.33
Sigma 0.31	0.47		

-----P1P2-----

Along	Cross	A-Octal-B	Minutes
Avg 164243.68	114.01		170.62
Sigma 0.46	0.48		

-----BUMPER A-----

Along	Cross	A-Octal-B	Minutes
Avg 331959.80	239.00		171.03
Sigma 0.00	0.00		

-----P2P3-----

Along	Cross	A-Octal-B	Minutes
Avg 328428.22	235.37		171.25
Sigma 0.43	0.59		

-----P0P5-----

Along	Cross	A-Octal-B	Minutes
Avg 1.17	-0.75		171.78
Sigma 0.56	0.57		

Along Scan Calibration

Time at end of Cal: 251.47

Facet	IFAR Counts	Preset Angles	No. a,b
P0P5	1.17 -0.75	-6.7182000E-02	1.6424319E 05
P1P4	164243.19 113.75	0.0000000E 00	2.4465552E 06
P2P3	328428.46 235.25	6.7159700E-02	1.0321483E 03

K = 0.500086

Bumper A: 331959.33

Bumper B: -3148.47

CROSS SCAN conversion factor: 0.409urad/IFAR count

CROSS AXIS THERM DRIFT RATE: 0.09urad/min

CROSS SCAN linear term desired: 96.54urad

data collection: 2: tapeAT-FM, trk6, file5, rev22681

Time at end of SCAN: 252.40 172.67

Time between Cal and Scan: 0.93min

CROSS AXIS DRIFT: (last P0 to SCAN): -0.09urad

CROSS AXIS REFERENCE OFFSET: -0.39urad

ORIGINAL PAGE IS
OF POOR QUALITY

--- Tape Error: 1.5.

Temp. Time and Voltage

Ch	Value	Unit	Ch	Value	Unit
0	-1.7000E-04	QUARTER	3	ERROR	
1	1.1750E-03	EU=6.81	5	2275.000	nAmps
2	1.4100E-03	EU=+371	5	28.450	nAmps
3	-1.2250E-03	EU=-271	5	24.580	nAmps
4	2.0113E-03	SMA -Z	1	24.875	Dec C
5	1.7400E-03	SMA -K	1	26.000	Dec C
6	1.0112E-03	SMA +Z	1	26.287	Dec C
7	1.0331E-03	SMA +K	1	25.471	Dec C
8	1.0331E-03	TCRQ:2KUG	1	25.974	Dec C
9	1.0331E-03	SME TEMP	2	31.052	Dec C
10	1.0331E-03	SAM TEMP	1	27.037	Dec C
11	7.6411E-00	EU=6.8V	4	7.641	Volts
12	3.0393E-03	MF(-Z-X)	3	24.195	Dec C
13	9.0993E-03	MF(+Z-X)	3	24.195	Dec C
14	5.1197E-01	SME(1)TEL	4	0.519	Volts
15	4.4214E-00	SME(2)TEL	4	4.421	Volts
16	-1.0000E-04	SME PR U7	3	ERROR	
17	1.6333E-01	SAM1:8MP2	4	0.251	Volts
18	2.0532E-01	EU=+27V	4	30.582	Volts
19	-2.0532E-01	EU=-27V	4	-30.560	Volts

Data Tape Identifier: F1D6
Track for Data: 1
Initial Data File Number: 4
Scan Data File Number: 5
Normal Scan Data File Number: 6

=====

IF 'ERROR' 48 OCCURS DURING MARKING OF TAPE:

Type:to REMARK---press execute---press continue

=====

TELEMETRY PRINTOUT, 21 tape RT-F, trk0, file15, rev22381

Date: 3-3-81 Time: 0249ORIGINAL PAGE IS
OF POOR QUALITY

SMA Design: F-1 ACCEPT TEST
 Serial Number: 4
 Run Number: 11301 0349 3-3-81 R8
 Test Flow Event: K
 Test Number: 12
 Sequence Number: 6

data tape identifier: FID6
 track for data: 1
 INIT/CAL data file number: 4
 SCAN data file number: 5
 NORM/AVG SCAN data file number: 6
 Smoothing Coeffs file number: 0

mode selected: NORM/AVG

TELEMETRY PRINTOUT, 21 tape RT-F, trk0, file16, rev22381

Date: 3-3-81 Time: 0249

SMA MODE operation

scan 11: 1 no. of words transferred = 187

Line Length, N-1: 377 120 014 000
 Active Scan Time, N-1: 60742.81
 Final Time, N: 60743.48

TELEMETRY

Byte No	Name	Contents	Pulses	Time(μsec)
1	SWNC	005		
2	OPSTAT N	106	Bit 7 = 0: Scan N= Forward	
3	SONLIN N	130	88	16.58
4	TRNERR N	004 003	1027	193.54
6	TORPLS N	360 157	-3985	-750.97
8	SHSERR N-1	377 365	-11	-2.07
10	FHSERR N-1	000 014	12	2.26
12	SUNERR N-1	377 360 157	-3985	-750.97
15	SONCTR	000 111		
17	SONLIN N-1	250	-88	-16.58
18	TRNERR N-1	001 131	345	65.02
20	TORPLS N-1	357 312	-4150	-782.07
22	SHSERR N-2	000 017	15	2.83
24	FHSERR N-2	377 361	-15	-2.83
26	SUNERR N-2	377 357 312	-4150	-782.07
29	SONTYM N-2	004 353 031	322329	60743.01
32	NSCAN	221	No.Scans =	145 (decimal)

scan N: 2 no. of words transferred = 182

Line Length, N-1: 000 357 361 377
 Active Scan Time, N-1: 60743.19
 Final Time, N: 60743.30

TELEMETRY

Byte No	Name	Contents	Pulses	Time(μsec)
1	SWNC	246		
2	OPSTAT N	306	Bit 7 = 1: Scan N= Reverse	
3	SONLIN N	250	-88	-16.58
5	TRNERR N	001 131	345	65.02

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10	11	SHSERR	N-1	000	016	-4152	-782.45
12	13	SUMERR	N-1	377	361	-15	-2.83
15	16	SONCTR		000	112	-4150	-782.07
17	18	SONLIN	N-1	130		88	16.58
19	20	TRNERR	N-1	004	003	1027	193.54
20	21	TORPLS	N-1	360	157	-3985	-750.97
22	23	SHSERR	N-2	377	365	-11	-2.07
24	25	FHSERR	N-2	000	014	12	2.26
26	27	SUMERR	N-2	377	360	-3985	-750.97
29	30	SONTYM	N-2	004	353	022328	60742.82
32		NSCRNS		037		No.Scans =	31 (decimal)

Scan N: 38 no. of words transferred = 182

Line Length: N-1: 001 017 364 377

Active Scan Time: N-1: 60742.25

Final Time: N: 60742.92

TELEMETRY

Line No	Name	Contents	Pulses	Time(μsec)
1	SYNO	246		
2	OPSTAT N	306	Bit 7 = 1: Scan N= Reverse	
3	SONLIN N	250	-88	-16.58
4	TRNERR N	001 132	346	65.20
6	TORPLS N	357 315	-4147	-781.50
8	SHSERR N-1	000 020	16	3.02
10	FHSERR N-1	377 364	-12	-2.26
12	SUMERR N-1	377 357 312	-4150	-782.07
15	SONCTR	000 134		
17	SONLIN N-1	130	88	16.58
19	TRNERR N-1	004 002	1026	193.35
20	TORPLS N-1	360 156	-3986	-751.16
22	SHSERR N-2	377 366	-10	-1.88
24	FHSERR N-2	000 015	13	2.45
26	SUMERR N-2	377 360 155	-3987	-751.35
29	SONTYM N-2	004 353 026	022326	60742.45
32	NSCRNS	037	No.Scans =	31 (decimal)

Scan N: 39 no. of words transferred = 181

Line Length: N-1: 377 120 015 000

Active Scan Time: N-1: 60742.62

Final Time: N: 60743.48

TELEMETRY

Line No	Name	Contents	Pulses	Time(μsec)
1	SYNO	246		
2	OPSTAT N	166	Bit 7 = 0: Scan N= Forward	
3	SONLIN N	130	88	16.58
4	TRNERR N	004 001	1025	193.16
6	TORPLS N	360 160	-3984	-750.79
8	SHSERR N-1	377 365	-11	-2.07
10	FHSERR N-1	000 015	13	2.45
12	SUMERR N-1	377 360 157	-3985	-750.97
15	SONCTR	000 134		
17	SONLIN N-1	250	-88	-16.58
19	TRNERR N-1	001 132	346	65.20
20	TORPLS N-1	357 315	-4147	-781.50
22	SHSERR N-2	000 020	16	3.02
24	FHSERR N-2	377 364	-12	-2.26
26	SUMERR N-2	377 357 312	-4150	-782.07
29	SONTYM N-2	004 353 025	022325	60742.26
32	NSCRNS	037	No.Scans =	31 (decimal)

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Appendix B

Scan Mirror Assembly Acceptance Test Data

Part 14

Test Flow Event S

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DATA SHEET 4.3.5-1
OPERATIONAL PERFORMANCE
SCAN TO SCAN REPEATABILITY

TS 32015-004
8 March 1980

SMA Designation: F-1 ACCEPT TEST

S/N: 4

SAN MODE

SME (1) or (2):

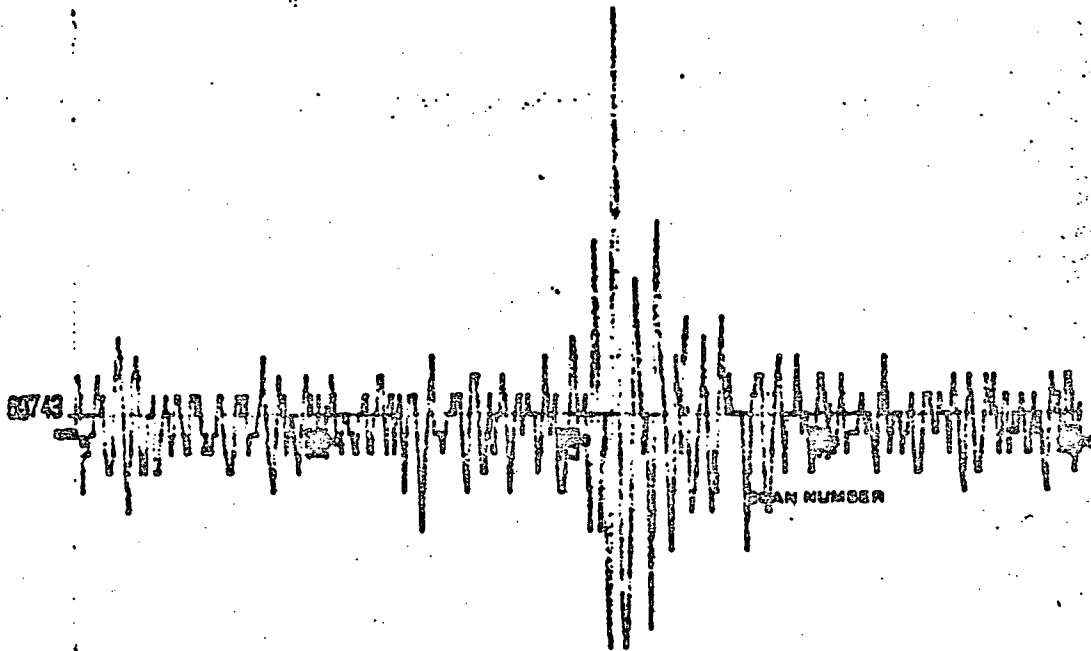
Voltage: High Nom Low

27.5 -27.3 5.8

400 CONSECUTIVE
(200 PWD, 200 REV)

200 FWD
200 REV

ACTIVE SCAN TIME, μ SEC



	CLOCK-CORRECTED LINE-LENGTH, μ SEC					
	MEAN	SPEC	P/P	ONE-SIGMA	SPEC	P/P
PWD	0372.55	03743 +1.5	P	1.53	0 TO 2.5	P
REV	0372.01	03743 +1.5	P	1.49	0 TO 2.0	P

Run No. 33481.0345

Test Flow Event S-1 esq 8

Comments test no. 1

QC Stamp

Date

Tested By

168

TS 32015-004

உருக

908620; DO NOT WRITE IN THESE SPACES. rev12188

SMA Designation: F-1 ACCEPT TEST

operation: SME(1) SAN

Test Flow Event: 3-1 Sea 6

Voltages: 27.5 -27.3 5.8

temperatures	T1 (+Z)	T2 (-Z)	T3 (+X)	T4 (-X)	T5 (BRDG)	T6 (SAM)	T7 (SME)	T8 (-Z-X)	T9 (+Z+X)
deg C	25.6	24.6	24.9	25.2	24.9	26.4	28.8	24.1	24.1

SCAN PARAMETER(400 scans)	MEASURED	REQUIREMENT	SPECIFICATION	P/F
---------------------------	----------	-------------	---------------	-----

clock freq. HZ 10612854 10612875 +-125 P

```
torque pulse width, usec      765      <1100
mean
sigma      13
```

turn-around time, usec 10590 +- 68

bumper A: mean	10651.9			P:
----------------	---------	--	--	----

0.1 0.1

bumper B: mean 10542.5 P 1

0.1

active scan time: usec

fwd: min 60740.9

max	60745.3
-----	---------

mean 60742.9

51900 0.5

rev: min 60740.7

max	60747.0
-----	---------

mean	60742.9
size	8.6

Standard	0.6			
combined mean	60712.8		60712.8 ± 0.2	8

combine: mean	60742.9	60743	+/-0.2
sigma	0.5	12.3	

align	0.5	12.5	P
scan period, usec	142680.2	142666 \pm 140	P

Scanned Period: 03/20	142000.2	142000.2-140	
-----------------------	----------	--------------	--

scan rate var. percent	+-1
------------------------	-----

```

fwd: min -0.003

```

max	0.004	P
-----	-------	---

rev: min -0.004 P ~

max	0.007	P
-----	-------	---

SAM offset(P0' mean), urad -3.41

[illegible]

Site#F(P0 Sigma), urad	0.32	<1.00	F
------------------------	------	-------	---

SAM angle, μ rad

```

sum angles_dread
freq: mean      134551

```

1001	1130	104031			
	31300	0.28	<1		P

rev: none 134550

simult	0.26	<1	P
--------	------	----	---

Tested by

QA

NO. REC'D - 22

[illegible]

SMA Designation:	F-1 ACCEPT TEST
Serial Number:	4
Run Number:	30481.0645
Test Flow Event:	5
Test Number:	1
Sequence Number:	6
Pressure:	4.00E-01 TORR

INITIALIZE Words Transferred: 4

Word Number 3: INTERRUPT (Row 177771 Octal)

Bit	Description	Setting
0	Panel Mode	1
1	Calibrate Mode	0
2	Scan Mode	0

Word Number 1: PANEL STATUS (Raw 842402 Octal)

Bit	Description	Setting
0	Bumper SW On	0
1	See SAM P0/P3	1
2	See SAM P2/P5	1
3	See SAM PA/PB	0
45	Processed SAM	1
45	Raw SAM	0
45	SAM 1 or SAM 2	0
45	SAM 3 (CAL SAM)	0
6	Single Reset	0
9	End SAM P0-P3	0
9	End SAM P2-P5	1
9	End SAM PD-PE	0
10	Ext. Reset	1
11	S Facet	0
12	Calibrate Mode	0
12	Scan Mode	0
14	Initialize Mode	0
15	Interrupt Mode	1

NO. of Pages: 10
 NO. of Sheets: 10
 NO. of Symbols: 10
 NO. of Symbols: 10

[illegible]

K = 0.500606

BURGER A1	0.00
BURGER B1	0.00

Temple, 1944, p. 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845,

Ln	Source	Dest	Col	Measurement
1	EU=+27V	EU=+27V	1	EU=+27V
2	EU=+27V	EU=+27V	2	EU=+27V
3	EU=+27V	EU=+27V	3	EU=+27V
4	SMA=+5V	SMA=+5V	1	SMA=+5V
5	SMA=+5V	SMA=+5V	1	SMA=+5V
6	SMA=+5V	SMA=+5V	1	SMA=+5V
7	SMA=+5V	SMA=+5V	1	SMA=+5V
8	SMA=+5V	SMA=+5V	1	SMA=+5V
9	TOFO BRDG	TOFO BRDG	1	TOFO BRDG
10	SNE TEMP	SNE TEMP	2	SNE TEMP
11	SAM TEMP	SAM TEMP	1	SAM TEMP
12	EU=6.8V	EU=6.8V	4	EU=6.8V
13	MF=+27V	MF=+27V	3	MF=+27V
14	MF=+27V	MF=+27V	3	MF=+27V
15	SNE(1) TEL	SNE(1) TEL	4	4.384 Volts
16	SNE(2) TEL	SNE(2) TEL	4	6.294 Volts
17	SNE PP U7	SNE PP U7	3	ERROR
18	SAM1 BHP2	SAM1 BHP2	4	3.847 Volts
19	EU=+27V	EU=+27V	4	27.479 Volts
20	EU=-27V	EU=-27V	4	-27.479 Volts

IF 'ERROR 60' OCCURS DURING MARKING OF TAPE:
 STOP TO PENALTY--press execute--press continue

Data Tape Identifier:	FID6
Track - or Data:	1
Init Cell Data File Number:	7
Scen Data File Number:	8

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DATA SHEET 4.3.5-1
OPERATIONAL PERFORMANCE
SCAN TO SCAN REPEATABILITY

TS 32015-004
8 March 1980

SMA Designation F-1 ACCEPT TEST

S/N: 4

BLUPER MODE

1

Voltage: High , Nom , Low

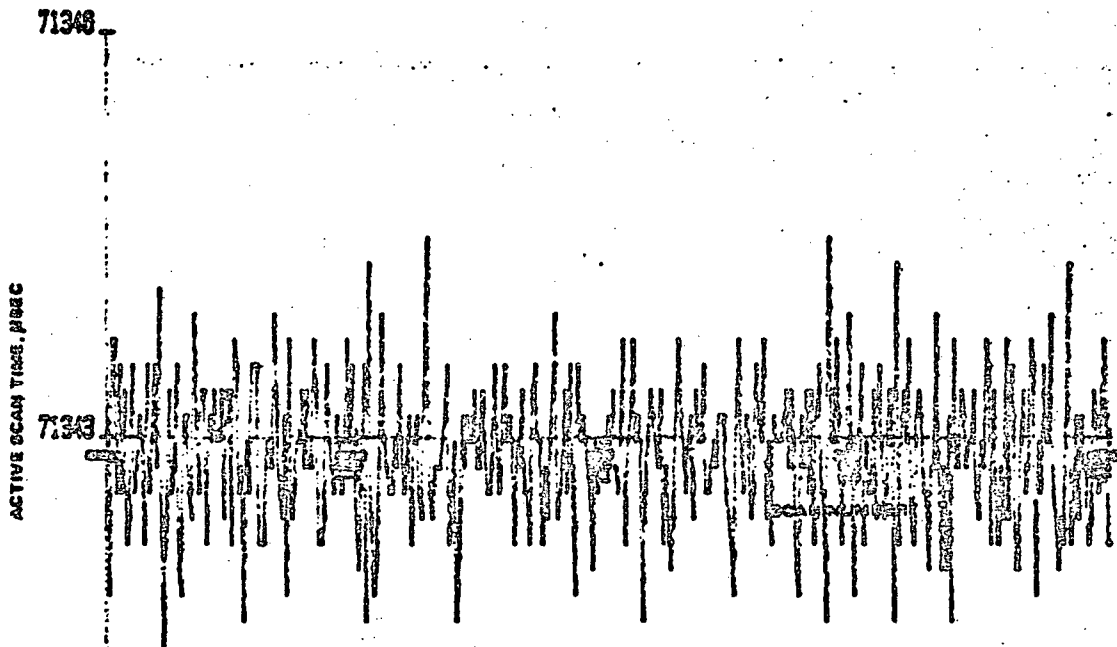
SME (1) or (2):

27.5 -27.3 5.8 -

400 CONSECUTIVE
(200 FWD, 200 REV)

200 FWD

200 REV



	CLOCK-CORRECTED LINE-LENGTH, μ SEC					
	MEAN	SPEC	P/P	ONE-SIGMA	SPEC	P/P
FWD	71342.00	71343	P	0.53	0 TO 2.0	P
REV	71342.07	71343	P	0.54	0 TO 2.0	P

Run No. 32481.057

Test Flow Event S-3 eq 8

Comments test no. 3

QC Stamp

Date

Tested By

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DATA SHEET 4252
OPERATIONAL PERFORMANCE
SCAN PARAMETERS

TS 32015-004

Rev 3

attach to data sheet 4.3.5-2 400scan parameter; tape; rev 121380

OPERATIONAL PERFORMANCE
SCAN PARAMETERS

SMA Designation: F-1 ACCEPT TEST
Serial Number: 4
Run Number: 30481.0857
temperatures T1 T2 T3 T4 T5 T6 T7 T8 T9
(+2) 25.7 24.7 25.0 25.3 (-X) (BRDG) (SAM) (SHE) (-2-X) (+2+X)
deg C 25.7 24.7 25.0 25.3 25.1 26.5 29.0 24.1 24.1

SCAN PARAMETER (400 scans) MEASURED REQUIREMENT SPECIFICATION P/F

clock freq, HZ 10612853 10612875 + -125 P

torque pulse width, usec 853
mean 23
sigma

bumper to bumper time, usec

fwd: min 71341.6
max 71344.5
mean 71342.9
sigma 0.5

rev: min 71341.5
max 71344.3
mean 71342.9
sigma 0.5

combined mean 71342.9
sigma 0.5

scan period, usec 142685.8

scan rate var, percent

fwd: min -0.002
max 0.002
rev: min -0.002
max 0.002

71343 + -0.8
<2.9

142686 + -1.6

P P P

Tested by

QA

NO. REQ'D = 22

Temperatures and Volatiles

Ch	Channel	Dev	Device	Cal	Measurement
9	9.12517E 02	02	SMR -2	1	24.601 Dec 0
12	9.12517E 03	03	MF10-2	3	24.113 Dec 0
13	9.12508E 03	03	MF10-2	3	24.137 Dec 0

Date: 3-30-81 Time: 0857

```
SPR Destination: F-1 ACCEPT TEST
Serial Number: 4
Run Number: 30481.0857
Test Flow Event: 8
Test Number: 3
Sequence Number: 6
Pressure: 5.00E-01 TORR
```

```
INITIALIZE      Words Transferred: 41
```

Word Number: 9: INTERRUPT (Row 177771 Octal)

Bit	Description	Setting
0	Panel Mode	1
1	Calibrate Mode	0
2	Scan Mode	0

Word Number 1: PANEL STATUS (Row 042402 Octal)

Bit	Description	Setting
0	Bumper SW On	0
1	See SAM P0/P3	1
2	See SAM P2/P5	0
3	See SAM PA/PS	0
4-5	Processed SAM	1
4-5	Raw SAM	0
4-5	SAM 1 or SAM 2	0
4-5	SAM 3 (CARL SAM)	0
6	Single Reset	0
7	End SAM P0/P3	0
8	End SAM P2/P5	1
9	End SAM PD/PE	0
10	Ext Reset	1
11	5 Facet	0
12	Calibrate Mode	0
13	Scan Mode	0
14	Initialize Mode	1
15	Slow Telemetry Mode	0

Word Numbers 2 and 3: (Raw 000000 007157 Octal)

```
Scan Count Preset:      7157 Octal      No. of Scans:      400
Time Count Preset:      00000000      No. of Samples:      0
```

```
Number of Scans of S$ Dimension: 400
Dimension of S$ Array: 15225
Dimension of W$ Array: 880
```

ALIBATE: 660.5ME: 1

Facet - IFIR Counts	Facet Angles	No. obs
P0P5 0.00	-3.7170000E-02	1.5892000E 05
P1P4 1.03400.00	0.0000000E 00	2.4423000E 06
P2P3 3.67840.00	6.7158000E-02	-1.2645250E 04

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Sumner A: 0.00
Sumner B: 0.00

Temperatures and Voltages

Ch	Scanner Out	Device	Cal	Measurement
0	-1.0000E 04	QUARTER	3	ERROR
1	2.6240E-02	EU=6.81	5	2684.000 nAmps
2	-1.6790E-03	EU=+27V	5	33.530 nAmps
3	-1.3350E-03	EU=-37V	5	26.700 nAmps
4	2.0309E 03	SMA -Z	1	24.657 Deg C
5	1.9778E 03	SMA -X	1	25.332 Deg C
6	1.9489E 03	SMA +Z	1	25.747 Deg C
7	2.0037E 03	SMA +X	1	24.970 Deg C
8	1.9968E 03	TORQ.BPDG	1	25.060 Deg C
9	8.6044E 02	SME TEMP	2	29.022 Deg C
10	1.8951E 03	SAM TEMP	1	26.513 Deg C
11	5.8226E 00	EU=6.8V	4	5.823 Volts
12	9.1098E 03	MF(-Z-X)	3	24.117 Deg C
13	9.1064E 03	MF(+Z+X)	3	24.144 Deg C
14	4.2977E 00	SME(1)TEL	4	4.298 Volts
15	4.9523E-01	SME(2)TEL	4	0.495 Volts
16	-1.0000E 04	SME PR U7	3	ERROR
17	2.6132E-01	SAM1/BMP2	4	0.261 Volts
18	2.7479E 01	EU=+27V	4	27.479 Volts
19	-2.7347E 01	EU=-27V	4	-27.347 Volts

IF 'ERROR 60' OCCURS DURING MARKING OF TAPE:
type:ato REMARK---press execute---press continue

Data Tape Identifier: F1D6
Track for Data: 1
Init/Cal Data File Number: 9
Scan Data File Number: 10

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DATA SHEET 4.3.5-3
OPERATIONAL PERFORMANCE
ALONG SCAN GEOMETRIC REPEATABILITY

TS 32015-004
8 March 1980

SMA Designation F-1 ACCEPT TEST S/N 4

SAN MODE (and calibrated) deviation profile

SME (1) or (2) 1 Voltage: High Nom Low

IFAR COUNTS:

CALIBRATION

BUMPER A
P2 P3

MID - P1 P4
P3 P6

BUMPER B

SCANNING

MEAN
VALUES

P2
P1
P0

2.1
6.2
3.7

SAN OFFSETS, μ RAD

P3
P4
P5
LAST P0

1.2
2.2
2.9
3.5

TEMP: T1 T2 T3 T4 T5 T6 T7 T8 T9

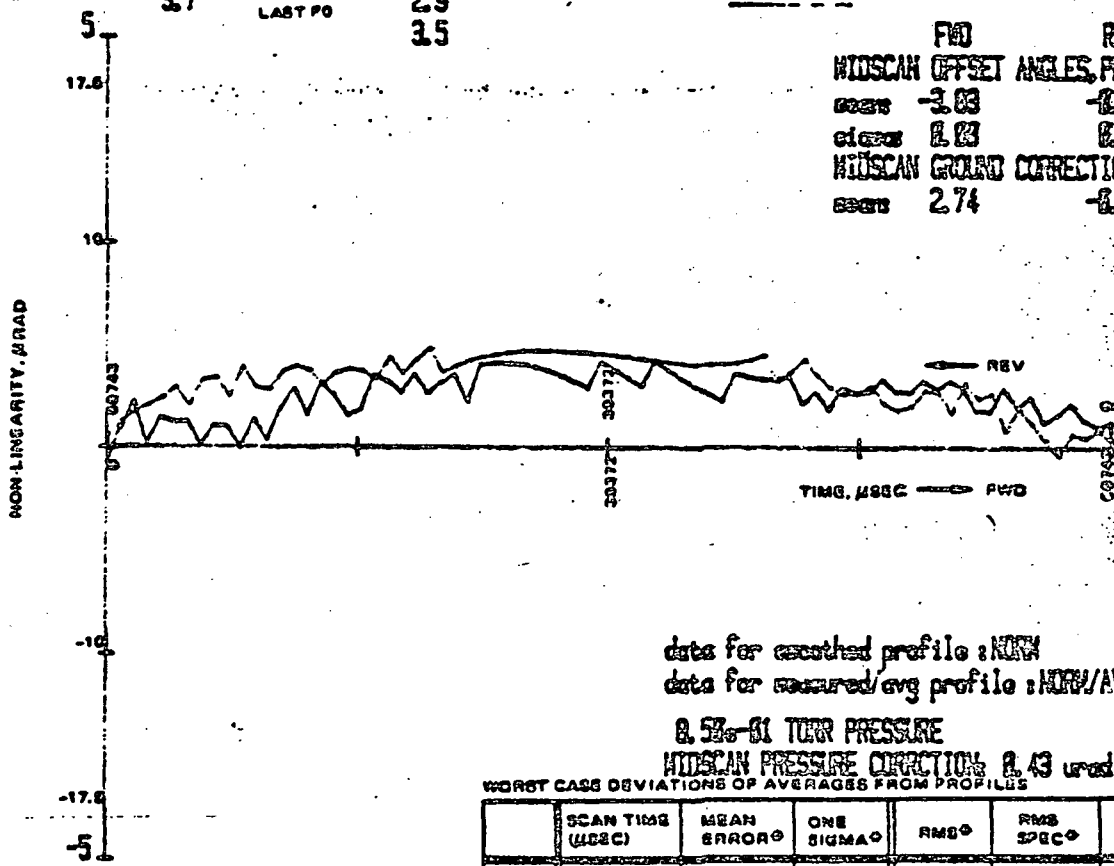
28.8 24.8 25.2 25.6 25.5 28.8 28.6 24.1 24.1

SAN ANGLES
USED (MRAD)

-87.171 87.159

FWD SMOOTHED PROFILE
(FROM TFE-H RUN NO 270150)
REV SMOOTHED PROFILE
MEASURED AVE, FWD
MEASURED AVE, REV

FWD REV
WIDSCAN OFFSET ANGLES, μ RAD, μ RAD
mean -3.83 -1.83
sigma 2.83 2.83
WIDSCAN GROUND CORRECTION
mean 2.74 -1.84



data for smoothed profile: NORM
data for measured/avg profile: NORM/AVG

0.5% - 0.1 Torr Pressure
WIDSCAN PRESSURE CORRECTION: 0.43 μ rad

WORST CASE DEVIATIONS OF AVERAGES FROM PROFILES

	SCAN TIME (μSEC)	MEAN ERROR	ONE SIGMA	RMS	RMS SPEC	P/P
FWD	28318.91	0.83	0.33	0.85		
REV	29937.13	1.14	0.29	1.17	<1.75	P

Run No. 33481.0346

Test Flow Event S-5 689 6

Comments test no. 5 19 FWD/19 REV SCAN 75 pta each

QA Stamp Date 30481

Tested By

ORIGINAL PAGE 18
OF POOR QUALITY

DATA SHEET 4.3.5-4
OPERATIONAL PERFORMANCE
CROSS SCAN REPEATABILITY

TS 32015-004
8 March 1980

SMA Designation F-1 ACCEPT TEST S/N 4

SAH 1005

SME (1) or (2) 1

Voltage: High , Nom , Low

27.5 -27.4 5.8

FORWARD LINEAR IFAR-ALIGNMENT
TERM REMOVED:

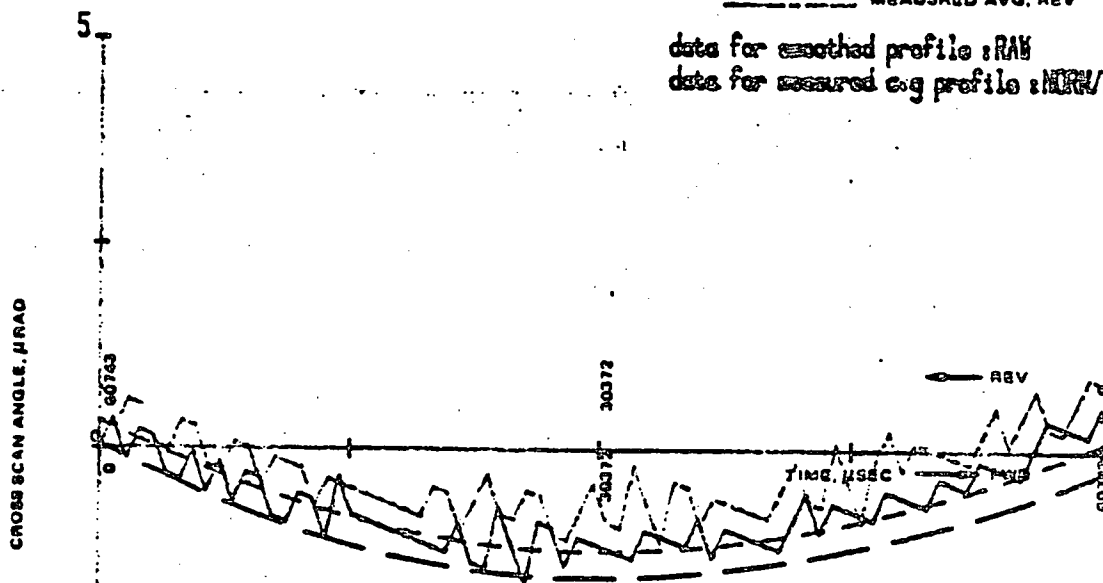
96.93 μ rad

(FROM TPE-F RUN NO.

____ FWD SMOOTHED PROFILE
(FROM TPE-F RUN NO. 1518)
____ REV SMOOTHED PROFILE
____ MEASURED AVG, FWD
____ MEASURED AVG, REV

data for smoothed profile: RAW

data for measured avg profile: NORM/AVG



WORST CASE DEVIATIONS OF AVERAGES FROM PROFILES 00						
	SCAN TIME (μSEC)	MEAN ERROR	ONE SIGMA	RMS	RMS SPEC	P/P
FWD	5746.92	0.75	0.20	0.78		
REV	4845.58	1.12	0.20	1.13	<1.5	P

PRESSURE:

8.520-01

0 MICRORADIANS

00 AFTER REMOVING THE LINEAR
IFAR-ALIGNMENT TERM THAT WAS REMOVED
FROM THE ORIGINAL PROFILE

Run No. 33481.8346

Test Flow Event S-5 seq 6

Comments test no. 5

QA Stamp

Date 33481

Tested By

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=====TEST INITIAL CONDITIONS=====

- (1) Fans must be off for at least 20 min.
(2) Both Lasers must be on at least 45 min
(3) DTS temp (+Z-X) must be +/-1 deg from (-Z-X)
(4) Chamber pressure must be less than 2 torr
(5) Cross axis polarity correct

Temperatures and Voltages

Ch	Scanner Out	Device	Cal	Measurement
4	2.8258E 03	SMA -Z	1	24.716 Deg C
12	9.1092E 03	MF(-Z-X)	3	24.122 Deg C
12	9.1071E 03	MF(+Z-X)	3	24.139 Deg C

Date: 030481 Time: 0946

SAR Designation: F-1 ACCEPT TEST
Serial Number: 4
Run Number: 30481.0946
Test Flow Event: 3
Test Number: 5
Sequence Number: 6

INITIALIZE Words Transferred: 4

Word Number 0: INTERRUPT (Raw 177771 Octal)

Bit	Description	Setting
0	Panel Mode	1
1	Calibrate Mode	0
2	Scan Mode	0

Word Number 1: PANEL STATUS (Raw 040402 Octal)

Bit	Description	Setting
0	Bumper SW On	0
1	Beg SAM P0/P3	1
2	Beg SAM P2/P5	0
3	Beg SAM PA/PB	0
4	Processed SAM	1
45	Raw SAM	0
45	SAM 1 or SAM 2	0
45	SAM 3 (CAL SAM)	0
5	Single Reset	0
7	End SAM P0/P3	0
8	End SAM P2/P5	1
9	End SAM PD/PE	0
10	Ext Reset	0
11	5-Facet	0
12	Calibrate Mode	0
13	Scan Mode	0
14	Initialize Mode	1
15	Slow Telemetry Mode	0

Word Numbers 2 and 3: (Raw 176747 057730 Octal)

Scan Count Preset:	7730 Octal	No. of Scans:	39
Time Count Preset:	3757165	No. of Samples:	75

Number of Scans of S# Dimension: 41
S# x Samples: 3075
Number of Samples plus 1: 76
Dimension of S# Array: 14950

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Calibration 1 1 1 1
-----P1P5-----

Along	Cross	A-Octal-B	
Ave 3.38	0.03	Minutes:	587.88
Sigma 0.45	0.17		

-----BUMPER B-----

Along	Cross	A-Octal-B	
Ave -1462.00	0.00	Minutes:	587.47
Sigma 0.00	0.00		

-----P1P2-----

Along	Cross	A-Octal-B
-------	-------	-----------

Along	Cross	A-Octal-B
-------	-------	-----------

-----P0P5-----

Along	Cross	A-Octal-B	
Ave -0.02	0.20	Minutes:	590.55
Sigma 0.33	0.58		

-----BUMPER B-----

Along	Cross	A-Octal-B	
Ave -3170.80	-2.00	Minutes:	590.93
Sigma 0.41	0.00		

-----P1P2-----

Along	Cross	A-Octal-B	
Ave 164230.00	115.66	Minutes:	591.23
Sigma 0.00	0.61		

-----BUMPER A-----

Along	Cross	A-Octal-B	
Ave 331927.95	240.00	Minutes:	591.65
Sigma 0.22	0.00		

-----P2P3-----

Along	Cross	A-Octal-B	
Ave 328385.15	237.63	Minutes:	591.87
Sigma 0.36	0.48		

-----P3P5-----

Along	Cross	A-Octal-B	
Ave -0.55	1.01	Minutes:	592.42
Sigma 0.84	0.76		

Along Scan Calibration
Time at end of Cal: 952.25

C-3

ORIGINAL PAGE IS
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Facet	IFAR Counts	Preset Angles	Norm. B
P2F5	-3.65 1.01	-6.7170900E-02	1.6422010E 05
P1P4	154226.10 116.17	0.0000000E 00	2.4464575E 06
P2F3	328385.20 237.67	6.7159200E-02	1.2017700E 04

K = 0.500095

Bumper A: 331928.03

Bumper B: -3178.67

CROSS SCAN conversion factor: 0.409urad/IFAR count

CROSS AXIS THERM DRIFT RATE: 0.18urad/min

CROSS SCAN linear term desired: 96.89urad

data collection: 2itapeAT-FM, trk0, file5, rev22681

Time at end of SCAN: 953.35 593.58

Time between Cal and Scan: 1.10min

CROSS AXIS DRIFT (last P0 to SCAN): 0.20urad

CROSS AXIS REFERENCE OFFSET: 0.61urad

Chamber Pressure (torr): 0.85

Temperatures and Voltages

Ch	Scanner Out	Device	Cal	Measurement
0	-1.0000E 04	QUARTER	3	ERROR
1	2.6807E-02	EU=6.81	5	2680.700 mAmps
2	1.6040E-03	EU=+27I	5	32.080 mAmps
3	-1.2020E-03	EU=-27I	5	25.640 mAmps
4	2.0218E 03	SMA -Z	1	24.762 Deg C
5	1.9574E 03	SMA -X	1	25.625 Deg C
6	1.9334E 03	SMA +Z	1	25.969 Deg C
7	1.9852E 03	SMA +X	1	25.227 Deg C
8	1.9660E 03	TORQ, BRDG	1	25.501 Deg C
9	8.3940E 02	SME TEMP	2	29.628 Deg C
10	1.8722E 03	SAM TEMP	1	26.846 Deg C
11	5.8165E 00	EU=6.8V	4	5.816 Volts
12	9.1082E 03	MF(-Z-X)	3	24.130 Deg C
13	9.1062E 03	MF(+Z+X)	3	24.146 Deg C
14	5.2382E-01	SME(1)TEL	4	0.524 Volts
15	4.2943E 00	SME(2)TEL	4	4.294 Volts
16	-1.0000E 04	SME PR U7	3	ERROR
17	2.6571E-01	SAM1/BMP2	4	0.266 Volts
18	2.7480E 01	EU=+27V	4	27.480 Volts
19	-2.7350E 01	EU=-27V	4	-27.350 Volts

Data Tape Identifier: F1D7

Track for Data: 0

Cal Data File Number: 1

Scan Data File Number: 2

Norm/Avg Scan Data File Number: 3

IF 'ERROR' 48 OCCURS DURING MARKING OF TAPE:

press: to REMARK---press execute---press continue

TAT A 10657 181

TATB = $\frac{107.85}{10537}$

Line	Length	Name	Contents	Pulses	Time(μsec)
10	11	SHSEPP N-1	377 354	-20	-3.77
12	14	SUMERR N-1	377 357 307	-4153	-782.63
13	16	SCNCTR	000 320		
14	17	SCNLIN N-1	130	88	16.58
15	19	TRNERR N-1	003 305	965	181.85
16	21	TORPLS N-1	360 143	-3997	-753.24
17	23	SHSEPP N-2	377 361	-15	-2.83
18	24	FHSEPP N-2	000 020	16	3.02
19	25	SUMERR N-2	377 360 143	-3997	-753.24
20	30	SCNTYM N-2	004 353 026	322326	60742.45
21	32	NSCANS	037		

No.Scans = 31 (decimal)

Scan N: 38 no. of words transferred = 182

Line Length: N-1: 001 217 352 377
 Active Scan Time: N-1: 60742.62
 Final Time: N: 60743.30

ORIGINAL PAGE IS
OF POOR QUALITY

TELEMETRY

Line	No	Name	Contents	Pulses	Time(μsec)
1	1	SYNC	200		
2	2	OPSTAT N	006		
3	3	SCNLIN N	130	88	16.58
4	5	TRNERR N	001 107	327	61.62
5	7	TORPLS N	357 307	-4153	-782.63
6	9	SHSEPP N-1	000 030	24	4.52
7	11	FHSEPP N-1	377 352	-22	-4.15
8	14	SUMERR N-1	377 357 306	-4154	-782.62
9	16	SCNCTR	000 320		
10	17	SCNLIN N-1	130	88	16.58
11	19	TRNERR N-1	003 305	965	181.85
12	21	TORPLS N-1	360 143	-3997	-753.24
13	23	SHSEPP N-2	377 361	-15	-2.83
14	24	FHSEPP N-2	000 020	16	3.02
15	25	SUMERR N-2	377 360 143	-3997	-753.24
16	30	SCNTYM N-2	004 353 030	322328	60742.82
17	32	NSCANS	037		

No.Scans = 31 (decimal)

Scan N: 39 no. of words transferred = 181

Line Length: N-1: 377 000 020 000
 Active Scan Time: N-1: 60743.00
 Final Time: N: 60743.86

TELEMETRY

Line	No	Name	Contents	Pulses	Time(μsec)
1	1	SYNC	200		
2	2	OPSTAT N	006		
3	3	SCNLIN N	130	88	16.58
4	5	TRNERR N	003 304	964	181.67
5	7	TORPLS N	360 144	-3996	-753.05
6	9	SHSEPP N-1	377 360	-16	-3.02
7	11	FHSEPP N-1	000 020	16	3.02
8	14	SUMERR N-1	377 360 144	-3996	-753.05
9	16	SCNCTR	000 320		
10	17	SCNLIN N-1	250	-88	-16.58
11	19	TRNERR N-1	001 107	327	61.62
12	21	TORPLS N-1	357 307	-4153	-782.63
13	23	SHSEPP N-2	000 030	24	4.52
14	24	FHSEPP N-2	377 352	-22	-4.15
15	25	SUMERR N-2	377 357 306	-4154	-782.62
16	30	SCNTYM N-2	004 353 027	322327	60742.64
17	32	NSCANS	037		

No.Scans = 31 (decimal)

ORIGINAL PAGE IS
OF POOR QUALITY

18

DATA SHEET 4.1.6-1
OPERATIONAL PERFORMANCE
SCAN TO SCAN REPEATABILITY

TS 32015-004
8 March 1980

SMA Designation: 1 ACCEPT TEST

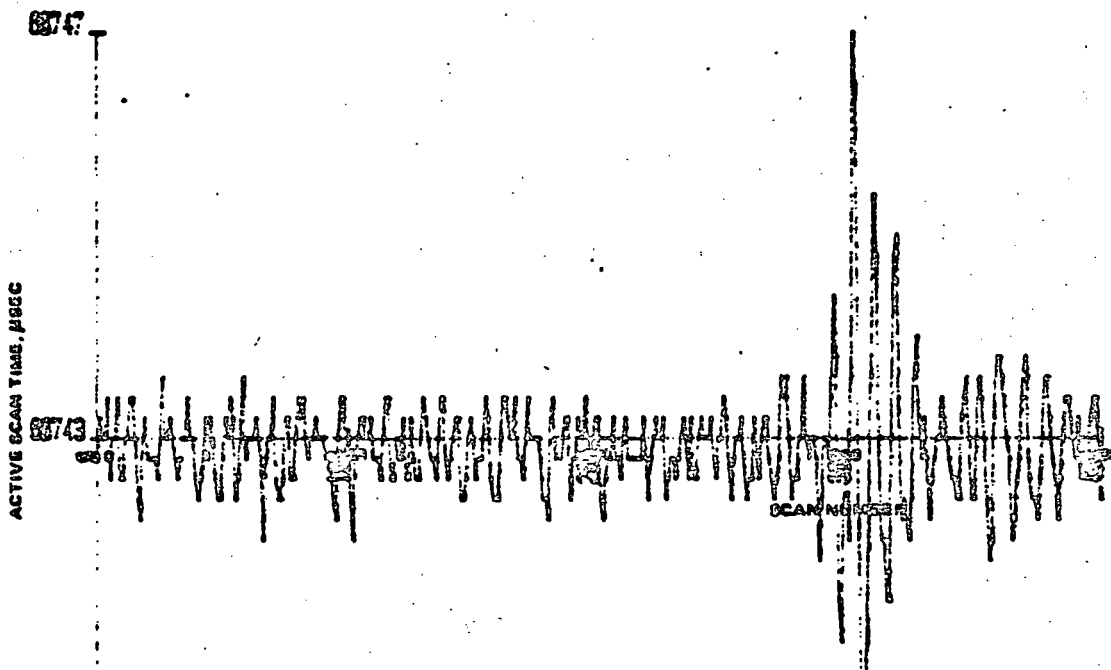
S/N: 1 SH HOLE 2
SME (1) or (2):

Voltage: High , Nom , Low

27.5 -27.3 5.8

400 CONSECUTIVE
(200 PWD, 200 REV)

200 PWD
200 REV



	CLOCK-CORRECTED LINE-LENGTH, μ SEC					
	MEAN	SPEC	P/P	ONE-SIGMA	SPEC	P/P
PWD	06742.93	06743	P	1.54	0 TO 2.0	P
REV	06742.92	06743	P	1.55	0 TO 2.0	P



Run No. 32481.005

QC Stamp Date 3/4/81

Test Flow Event S-8 seq 8

Tested By

Comments test no. 8

ORIGINAL PAGE IS
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DATA SHEET 4.3.5-2
OPERATIONAL PERFORMANCE

TS 32015-004

attach to data sheet 4.3.5-2

400 scan parameter report: 2186

OPERATIONAL PERFORMANCE
SCAN PARAMETERS

SMA Destination: F-1 ACCEPT TEST

Serial Number: 4

Run Number: 30481.0907

operation: SNE(2) SAM

Test Flow Event: S-8 Seq 6

Voltages: 27.5 -27.3 5.

temperatures	T1	T2	T3	T4	T5	T6	T7	T8	T9
	(+Z)	(-Z)	(+X)	(-X)	(BRDG)	(SAM)	(SME)	(-Z-X)	(+Z+X)
des C	25.8	24.7	25.1	25.4	25.2	26.4	29.1	24.1	24.1

SCAN PARAMETER (400 scans)	MEASURED	REQUIREMENT	SPECIFICATION	P/F
----------------------------	----------	-------------	---------------	-----

clock freq: Hz	10612853	10612875 +-125		P
----------------	----------	----------------	--	---

torque pulse width: usec				
mean	766	<1100		P
sigma	12			

turn-around time: usec		10590 +- 68		
------------------------	--	-------------	--	--

bumper A: mean	10648.9			P
sigma	0.1			

bumper B: mean	10530.8			P
sigma	0.2			

active scan times: usec

fwd: min	60740.4			
max	60746.8			
mean	60742.9			
sigma	0.6			
rev: min	60740.2			
max	60746.2			
mean	60742.9			
sigma	0.5			

combine: mean	60742.9	60743 +-0.2		P
sigma	0.5	<2.9		P

scan period: usec	142665.5	142666 +-140		P
-------------------	----------	--------------	--	---

scan rate var: percent

fwd: min	-0.004			P
max	0.006			P
rev: min	-0.005			P
max	0.005			P

SAM offset(P0 mean): urad -1.89

line start pulse angular jitter(P0 sigma): urad	0.28	<1.00		P
---	------	-------	--	---

SAM angle: urad

fwd: mean	134580			
sigma	0.30	<1		P
rev: mean	134578			
sigma	0.26	<1		P

Tested by

QA

NO. REQ'D = 22

[illegible]

Date: 10/04/01 Time: 0907

```

SDR Description:      F-1 ACCEPT TEST
Serial Number:        4
Run Number:           36401.0907
Test Flow Event:      3
Test Number:          3
Sequence Number:      3
Press. Cell:          5.00E-01 Torr

```

INITIALIZE Words Transferred: 4

Word number 3: INTERPUFT (Row 177771 Octal)

File	Installation	Settings
0	Panel Mode	1
1	Collocate Mode	0
2	Scan Mode	0

Word Number 1: PANEL STATUS (Row 042402 Octal)

Bit	Description	Setting
0	Bumper SW On	0
1	See SAM P0/P3	1
2	See SAM P2/P5	0
3	See SAM PA 50	0
4	Processed SAM	1
5	Raw SAM	0
6	SAM 1 or SAM 2	0
7	SAM 3 (CAL SAM)	0
8	Single Reset	0
9	End SAM P0/P3	0
10	End SAM P2/P5	1
11	End SAM PD/PE	0
12	Ext Reset	1
13	S Facet	0
14	Calibrate Mode	0
15	Scan Mode	0
16	Initialize Mode	1
17	Slow Telemetry Mode	0

Word Numbers 2 and 3: (Raw 000000 007157 Octal)
 Scan Count Preset: 7157 Octal No. of Scans: 400
 Time Count Preset: 0000000 No. of Samples: 0

```
Number of Seeds of S$ Dimension: 400
Dimension of S$ Array: 15226
Dimension of W$ Array: 800
```

ALIBRATE: SAM/SME: 2

Factor	1749 Counts	Preset Angle	No. a,b
7000	0.00	-6.7182000E-02	1.6392000E 05
7001	1.0000E-01	0.0000000E+00	3.4181807E 02
7002	1.0194E-02	9.7717170E-03	-3.4895114E 02

... 1. = 1. 500.00

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OF POOR QUALITY

Runper: B1 0.00
Runper: B1 0.00

Ch	Source	Device	Cal	Measurement
0	-1.0000E-04	QUARTER	3	ERROR
1	2.0632E-02	EU=6.8I	5	2883.200 nAmps
2	1.3450E-03	EU=+27I	5	31.960 nAmps
3	-1.2060E-03	EU=-27I	5	25.720 nAmps
4	2.0282E-03	SMA -Z	1	24.689 Deg C
5	1.9733E-03	SMA -X	1	25.397 Deg C
6	1.9345E-03	SMA +Z	1	25.810 Deg C
7	1.9974E-03	SMA +X	1	25.052 Deg C
8	1.9889E-03	TORQ BRDG	1	25.174 Deg C
9	2.5942E-02	SME TEMP	2	29.051 Deg C
10	1.9008E-03	SAM TEMP	1	26.433 Deg C
11	5.8142E-00	EU=6.8V	4	5.814 Volts
12	9.1099E-03	MF(-Z-X)	3	24.117 Deg C
13	9.1075E-03	MF(+Z+X)	3	24.135 Deg C
14	5.2942E-01	SME(1)TEL	4	0.528 Volts
15	4.2961E-00	SME(2)TEL	4	4.296 Volts
16	-1.0000E-04	SME PR U7	3	ERROR
17	2.6837E-01	SAM1/BMP2	4	0.268 Volts
18	2.7479E-01	EU=+27V	4	27.479 Volts
19	-2.7348E-01	EU=-27V	4	-27.348 Volts

=====

1 'ERROR 60' OCCURS DURING MARKING OF TAPE:

type:sto REMARK---press execute--press continue

=====

Data Tape Identifier: F106

Tach for Data: 1

1st Cal Data File Number: 11

Scn Data File Number: 12

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TS 32015-004
8 March 1980

DATA SHEET 4.3.5-1
OPERATIONAL PERFORMANCE
SCAN TO SCAN REPEATABILITY

SMA Designation F-1 ACCEPT TEST

S/N: 4

ELPER HITE

2

SME (1) or (2):

Volts: High —, Nom —, Low —

27.5 -27.4 5.0

200 CONSECUTIVE
(100 FWD, 100 REV)

288 FWD
288 REV

71347

ACTIVE SCAN TIME, μ SEC

71343

71339

	CLOCK-CORRECTED LINE LENGTH, μ SEC					
	MEAN	SPEC	P/P	ONE-SIGMA	SPEC	P/P
FWD	71342.00	71343 + .6	P	0.5	0 TO 2.0	P
REV	71342.07	71343 + .6	P	0.4	0 TO 2.0	P

Run No. 33481.1818

Test Flow Event S-18 eq 6

Comments test no. 18

QC Stamp

Date

Tested By

Q

DATA SHEET 4.18-2
 OPERATIONAL PERFORMANCE
 SCAN PARAMETERS

TS 32015-004

Rev 3

ORIGINAL PAGE IS
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attach to data sheet 4.3.5-2 400scan parameter, tape, rev 121880

OPERATIONAL PERFORMANCE
 SCAN PARAMETERS

SMA Designation: F-1 ACCEPT TEST operation: SME(2) BUMPER
 Serial Number: 4 Test Flow Event: S-10 Seq 6
 Run Number: 30481.1018
 Temperatures T1 T2 T3 T4 T5 T6 T7 T8 T9
 (+Z) 25.9 24.8 25.3 (+X) (-X) (BRDG) (SM) (SME) (-Z-X) (+Z-X)
 deg C 25.9 24.8 25.3 25.6 25.6 26.7 29.6 24.1 24.2

SCAN PARAMETER(400 scans) MEASURED REQUIREMENT SPECIFICATION P/F

clock freq, HZ 10612850 10612875 \pm 125 P

torque pulse width, usec

mean 854
 sigma 55

bumper to bumper time, usec

fwd: min 71339.8
 max 71345.4
 mean 71342.9
 sigma 0.9

rev: min 71339.2
 max 71345.8
 mean 71342.9
 sigma 0.8

combined mean 71342.9
 sigma 0.9
 scan period, usec 142685.7

scan rate var, percent

fwd: min -0.004
 max 0.004
 rev: min -0.005
 max 0.004

71343 \pm 0.8
 < 2.9
 142686 \pm 1.6

P P P

Tested by

100-443887-100

Ch	Solver Out	Device	Cal	Measurement
4	2.024E-03	5MA-Z	1	24.754 Dec C
12	2.197E-03	MFC-3-10	3	24.138 Dec C
13	2.185E-03	MFC-3-10	3	24.152 Dec C

Total: 494-11 1995: 1018

```

SAR Description: F-1 ACCEPT TEST
Serial Number: 4
Run Number: 30481.1018
Test Flow Event: 5
Test Number: 10
Sequence Number: 5
Description: 9.50E-01 T045

```

Words Transferred: 4

Word Number of INTERRUPT (Row 177771 Octal)

Bit	Description	Setting
0	Panel Mode	1
1	Calibrate Mode	0
2	Scan Mode	0

Word Number 1: PANEL STATUS (Row 042402 Octal)

Set	Description	Setting
0	Bumper SW On	0
1	See SAM P0/P3	1
2	See SAM P2/P5	0
3	See SAM P4/P6	0
4	Processed SAM	1
5	Raw SAM	0
6	See 1 of SAM 2	0
7	SAM 2 LOCAL SAM?	0
8	Single Reset	0
9	End SAM P0/P3	0
10	End SAM P2/P5	1
11	End SAM P4/P6	0
12	Ext. Reset	1
13	5 Reset	0
14	1000 Hz Mode	0
15	500 Hz Mode	0
16	1000 Hz Mode	1
17	500 Hz Mode	0

ORIGINAL PAGE IS
OF POOR QUALITY

Line Count Preset: 7157 Octal
Time Count Preset: 0000000

No. of Scans: 400
No. of Samples: 0

Number of Scans or S\$ Dimension: 400
Dimension of S\$ Array: 15226
Dimension of H\$ Array: 800

CALISRATE: SAM/SEC: 2

Facet	IFAR Counts	Preset Angles	No. a, b
P0P5	0.00	-6.7182000E-02	1.6392000E 05
P1P4	163920.00	0.0000000E 00	2.4421805E 06
P2P3	327840.00	6.7159700E-02	-2.4095374E 04

K = 0.500000

Bumper A: 0.00
Bumper B: 0.00

Temperatures and Voltages

Ch	Scanner Out	Device	Cal	Measurement
0	-1.0000E 04	QUARTER	3	ERROR
1	2.5064E-02	EU=6.81	5	2508.430 mAmps
2	1.6250E-03	EU=+27V	5	32.500 mAmps
3	-1.3170E-03	EU=-27V	5	26.340 mAmps
4	2.8201E 03	SMA -Z	1	24.731 Deg C
5	1.9566E 03	SMA -X	1	25.636 Deg C
6	1.9364E 03	SMA +Z	1	25.926 Deg C
7	1.9826E 03	SMA +X	1	25.263 Deg C
8	1.9595E 03	TORQ. BRDG	1	27.595 Deg C
9	8.4168E 02	SME TEMP	2	29.563 Deg C
10	1.8825E 03	SAM TEMP	1	26.699 Deg C
11	5.8655E 00	EU=6.8V	4	5.865 Volts
12	9.1068E 03	MF(-Z-X)	3	24.141 Deg C
13	3.1349E 03	MF(+Z+X)	3	24.156 Deg C
14	2.9341E-01	SME(1)TEL	4	0.293 Volts
15	4.2985E 00	SME(2)TEL	4	4.298 Volts
16	-1.0000E 04	SME PR U7	3	ERROR
17	3.8403E 00	SAM1/BMP2	4	3.840 Volts
18	2.7481E 01	EU=+27V	4	27.481 Volts
19	-2.7352E 01	EU=-27V	4	-27.352 Volts

=====
IF 'ERROR 60' OCCURS DURING MARKING OF TAPE:
type:ato REMARK---press execute---press continue
=====

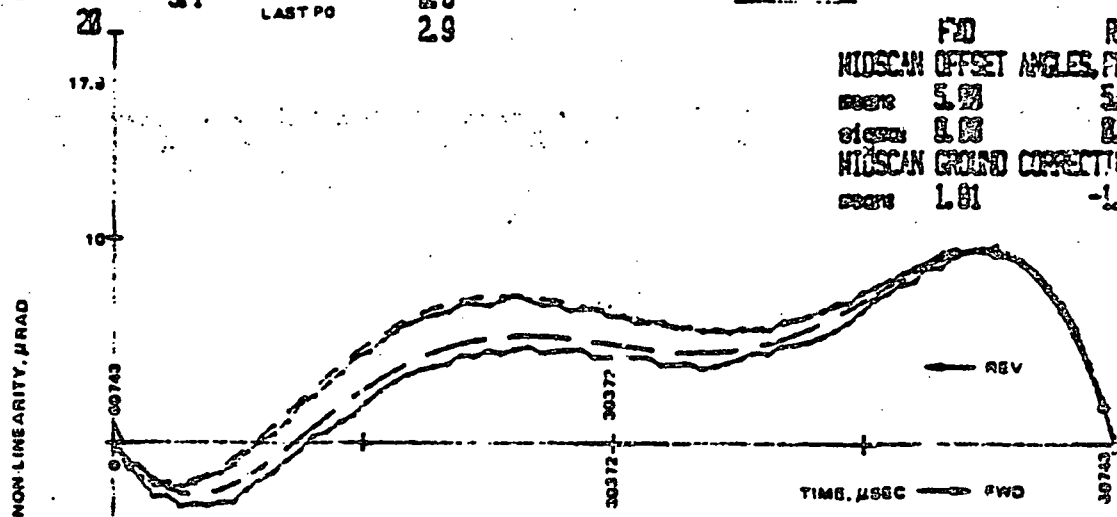
Data Tape Identifier: F106
Track for Data: 1
Init Cal Data File Number: 13
Scan Data File Number: 14

ORIGINAL PAGE IS
OF POOR QUALITY DATA SHEET 4.3.5-3
OPERATIONAL PERFORMANCE
ALONG SCAN GEOMETRIC REPEATABILITY

TS 32015-004
8 March 1980

SMA Designation F-1 ACCEPT TEST S/N 4
K = 2.500079
TEMP: T1 T2 T3 T4 T5 T6 T7 T8 T9
25.9 24.0 25.3 25.6 25.6 26.7 29.5 24.1 24.2
SMA MODE (and calibrated)
SME (1) or (2) 2
Voltage: High _____, Nom _____, Low _____
CALIBRATION
BUMPER A
P2 P3
MID - P1 P4
P5 P6
BUMPER B
SCANNING
SAM OFFSETS, μ RAD
P2 2.8 P3 -1.8
P1 4.1 P4 -1.5
P5 3.1 P6 0.8
LAST P0 2.9

MEAN VALUES
20
17.3
10
-10
-17.3
-20



FWD SMOOTHED PROFILE
FROM 1-2-4 RUN NO. 32015-004
REV SMOOTHED PROFILE
MEASURED AVG. FWD
MEASURED AVG. REV

FWD REV
MIDSCAN OFFSET ANGLES, PHIP, PHIP
ECCENT 5.00 5.00
ECCENT 0.00 0.00
MIDSCAN CORRECTION
ECCENT 1.01 -1.10

data for smoothed profile: NFM
data for measured/avg profile: NFM/AVG

0.52-01 Torr Pressure
MIDSCAN PRESSURE CORRECTION: 0.43 used

WORST CASE DEVIATIONS OF AVERAGES FROM PROFILES

	SCAN TIME (μ SEC)	MEAN ERROR	ONE SIGMA	RMS	RMS SPEC.	P/P
FWD	0.00	-1.02	0.20	0.72		
REV	00033.37	-1.26	0.33	0.41	01.75	P

Run No. 32015-004

Test Flow Event S-12 seq 6

Comments test no. 12.19 FWD/REV SCAN 75pts each

QA Stamp

Date

32015

Tested By

ORIGINAL PAGE IS
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DATA SHEET 4.3.5-4
OPERATIONAL PERFORMANCE
CROSS SCAN REPEATABILITY

TS 32015-004
8 March 1980

SMA Designation F-1 ACCEPT TEST S/N 4

SAN MODE

SME (1) or (2) 2

Voltage: High __, Nom __, Low __

27.5 -27.4 5.8

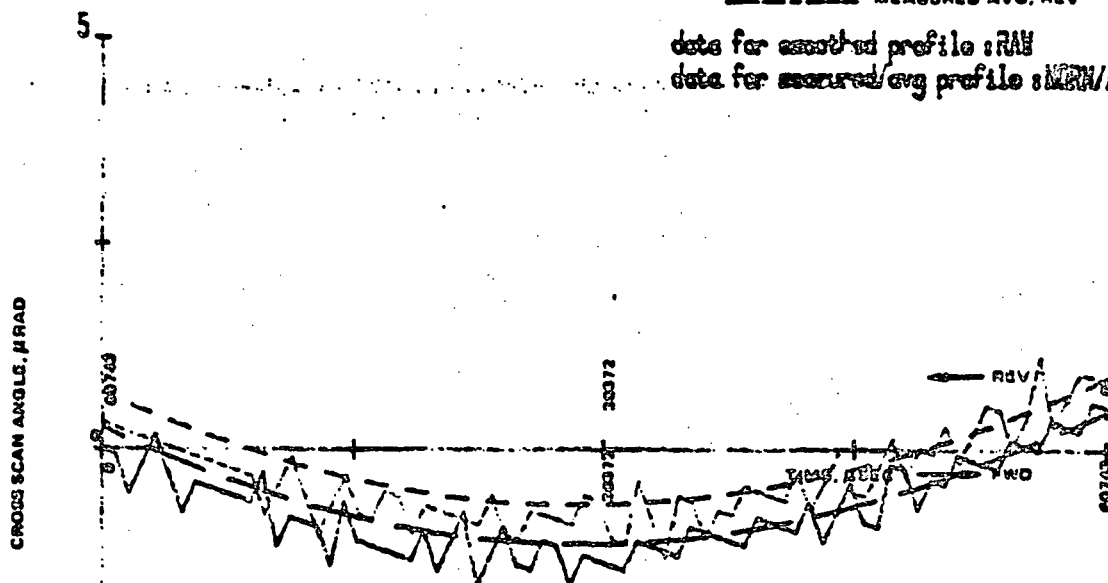
FORWARD LINEAR IPAR-ALIGNMENT
TERM REMOVED:

98.53 μ rad

(FROM TPE-P RUN NO.

--- FWD SMOOTHED PROFILE
(FROM TPE-P RUN NO. 3372, 103)
--- REV SMOOTHED PROFILE
--- MEASURED AVG, FWD
--- MEASURED AVG, REV

data for smoothed profile: RAW
data for measured/avg profile: MEAN/AVG



WORST CASE DEVIATIONS OF AVERAGES FROM PROFILES **						
	SCAN TIME (USEC)	MEAN ERROR	ONE SIGMA	RMS	RMS SPEC	P/P
FWD	13754.03	-2.65	0.19	0.65		?
REV	47737.59	-4.61	0.21	0.64	<1.5	?

PRECEDENCE:

0.535-01

** MICRORADIANS
** AFTER REMOVING THE LINEAR
IPAR-ALIGNMENT TERM THAT WAS REMOVED
FROM THE ORIGINAL PROFILE

Run No. 33481.1035

Test Flow Event S-12 seq 8

Comments test no 12

QA Stamp

Date 33481

Tested By

data collection: tapeRT-FM:trk0:file4:rev022731

=====TEST INITIAL CONDITIONS=====

- (1) Fans must be off for at least 20 min.
- (2) Both Lasers must be on at least 45 min
- (3) JTS temp (+Z-X) must be +/-1 deg from (-Z-X)
- (4) Chamber pressure must be less than 2 torr
- (5) Cross axis polarity correct

ORIGINAL PAGE 13
OF POOR QUALITY

Temperatures and Voltages

Ch	Scanner Out	Device	Cal	Measurement
4	2.0233E 03	SMA -Z	1	24.744 Deg C
12	9.1080E 03	MF(-Z-X)	3	24.131 Deg C
13	9.0962E 03	MF(+Z-X)	3	24.209 Deg C

Date: 030481

Time: 1005

Designation: F-1 ACCEPT TEST

Serial Number: 4

Run Number: 30481.1005

Test Flow Event: S

Test Number: 12

Sequence Number: 6

INITIALIZE

Words Transferred: 4

Word Number 0: INTERRUPT

(Raw 177771 Octal)

Bit	Description	Setting
0	Panel Mode	1
1	Calibrate Mode	0
2	Scan Mode	0

Word Number 1: PANEL STATUS

(Raw 042402 Octal)

Bit	Description	Setting
0	Bumper SW On	0
1	Beq SAM P0/P3	1
2	Beq SAM P2/P5	0
3	Beq SAM PA/PB	0
45	Processed SAM	1
45	Raw SAM	0
45	SAM 1 or SAM 2	0
45	SAM 3 (CAL SAM)	0
6	Single Reset	0
7	End SAM P0/P3	0
8	End SAM P2/P5	1
9	End SAM PD/PE	0
10	Ext Reset	1
11	5 Facet	0
12	Calibrate Mode	0
13	Scan Mode	0
14	Initialize Mode	1
15	Slow Telemetry Mode	0

Word Numbers 2 and 3:

(Raw 176747 057730 Octal)

Scan Count Preset: 7730 Octal

No. of Scans:

39

Time Count Preset: 3757165

No. of Samples:

75

Number of Scans of S# Dimension: 41

Scans & Samples: 3075

Number of Samples plus 1: 76

Number of Samples: 14950

ORIGINAL PAGE IS
OF POOR QUALITY

Along Cross A-Octal-B
Run 1.12 : : Minutes: 606.43
Sigma 0.00 1.00

-----PREF 6-----

Along Cross A-Octal-B
Run -3155.00 -1.00 Minutes: 606.83
Sigma 0.00 0.00

-----P1P2-----

Along Cross A-Octal-B
Run 164236.27 115.77 Minutes: 607.10
Sigma 0.40 1.03

-----BUMPER A-----

Along Cross A-Octal-B
Run 331950.65 342.00 Minutes: 607.52
Sigma 0.00 0.00

-----P2P3-----

Along Cross A-Octal-B
Run 328425.07 237.00 Minutes: 607.77
Sigma 0.00 0.00

-----P3P5-----

Along Cross A-Octal-B
Run 0.00 1.30 Minutes: 608.32
Sigma 0.00 0.46

Along Scan Collection
Time at end of Col:1008.19

Facet	IFAR Counts	Preset Angles	No. a,b
P3P5	0.00 1.30	-6.7182000E-02	1.6423869E 05
P1P4	164236.63 115.74	0.0000000E 00	2.4465444E 06
P2P3	328425.03 237.99	6.7159700E-02	-1.2765902E 03

K = 0.500073

Bumper A: 331950.65
Bumper B: -3155.65

CROSS SCAN conversion factor: 0.409rad/IFAR count
CROSS AXIS THERM DRIFT RATE: 0.01rad/min
CROSS SCAN linear term desired: 26.82rad

data collection: 3:tapeAT-FM, trk0, file5, rev22681

Time at end of SCAN:1009.17 609.28
Time between Col and Scan: 0.98min
CROSS AXIS DRIFT: last FO to SCAN: -0.01rad
CROSS AXIS DRIFT: 1st FO to SCAN: 0.53rad

ORIGINAL PAGE IS
OF POOR QUALITY

Water Pressure (torr): 0.35

Temperatures and Voltages

Ch	Scanner Out	Device	Cal	Measurement
0	-1.0000E 04	QUARTER	3	ERROR
1	4.6666E-02	EU=6.81	5	2666.800 nAmps
2	1.5690E-03	EU=+271	5	31.780 nAmps
3	-1.2710E-03	EU=-271	5	25.420 nAmps
4	3.0204E 03	SMA -Z	1	24.777 Deg C
5	1.0569E 03	SMA -X	1	25.633 Deg C
6	1.0553E 03	SMA +Z	1	25.941 Deg C
7	1.9833E 03	SMA +X	1	25.355 Deg C
8	1.9614E 03	TORQ BRDG	1	25.567 Deg C
9	9.4338E 02	SME TEMP	2	29.514 Deg C
10	1.8849E 03	SAM TEMP	1	26.663 Deg C
11	5.6144E 00	EU=6.8V	4	5.814 Volts
12	9.1073E 03	MF(-Z-X)	3	24.137 Deg C
13	9.1043E 03	MF(+Z-X)	3	24.160 Deg C
14	5.2628E-01	SME(1)TEL	4	0.526 Volts
15	4.2953E 00	SME(2)TEL	4	4.295 Volts
16	-1.0000E 04	SME PR U7	3	ERROR
17	2.6305E-01	SAN1/BMP2	4	0.263 Volts
18	2.7482E 01	EU=+27V	4	27.482 Volts
19	-2.7351E 01	EU=-27V	4	-27.351 Volts

Tape Identifier: F1D7
 Back for Data: 0
 Init/Cal Data File Number: 4
 Scan Data File Number: 5
 Raw/Avs Scan Data File Number: 6

 IF 'ERROR' 48 OCCURS DURING MARKING OF TAPE:
 type a REMARK---press execute---press continue

TELEMETRY PRINTOUT,1:tapeAT-F, trk0, file15, rev22381

Date: 030481 Time: 1005

IMA Designation: F-1 ACCEPT TEST
 Serial Number: 4
 Run Number: 30481.1005
 Test Flow Event: 9
 Test Number: 12
 Sequence Number: 6

ORIGINAL PAGE IS
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data tape identifier: F1D7
 track for data: 0
 INIT CAL data file number: 4
 SCAN data file number: 5
 NORM AVG SCAN data file number: 6
 Smoothing Coeffs file number: 0

mode selected: NORM AVG

TELEMETRY PRINTOUT,2:tapeAT-F, trk0, file16, rev22381

Data Date: 030481 Data Time: 1005

SAM MODE operation

scan N: 1 no. of words transferred = 187

Line Length, N-1: 377 060 016 000
 Active Scan Time, N-1: 60742.81
 Inal Time, N: 60742.73

TELEMETRY

Byte No	Name	Contents	Pulses	Time(μsec)
1	SYNC	006		
2	OPSTAT N	106		
3	SCNLIN N	130	Bit 7 = 0: Scan N= Forward	
4	5 TRNERR N	003 366	88	16.58
6	7 TORPLS N	360 154	1014	191.09
8	9 SHSERR N-1	377 363	-3988	-751.54
10	11 FHSERR N-1	000 016	-13	-2.45
12	13 14 SUMERR N-1	377 360 154	14	2.64
15	16 SCNCTR	000 107	-3988	-751.54
17	17 SCNLIN N-1	250	-98	-16.58
18	19 TRNERR N-1	001 145	357	67.28
20	21 TORPLS N-1	357 325	-4139	-780.00
22	23 SHSERR N-2	000 015	13	2.45
24	25 FHSERR N-2	377 362	-14	-2.64
26	27 28 SUMERR N-2	377 357 327	-4137	-779.62
29	30 31 SCNTYM N-2	004 353 032	322330	60743.20
32	NSCANS	046	No.Scans =	38 (decimal)

scan N: 2 no. of words transferred = 182

Line Length, N-1: 001 017 363 377
 Active Scan Time, N-1: 60742.43
 nal Time, N: 60743.11

TELEMETRY

Byte No	Name	Contents	Pulses	Time(μsec)
1	SYNC	246		
2	OPSTAT N	006	Bit 7 = 1: Scan N= Reverse	

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13	11	FHSERR	N-1	377	363	-13	-2.45
13	14	SUMERR	N-1	377	357 327	-4137	-779.62
15	16	SCNCTR		000	110		
	17	SCNLIN	N-1	130		88	16.58
13	19	TRNERR	N-1	003	366	1014	191.09
20	21	TORPLS	N-1	360	154	-3988	-751.54
22	23	SHSERR	N-2	377	363	-13	-2.45
24	25	FHSERR	N-2	000	016	14	2.64
27	28	SUMERR	N-2	377	360 154	-3988	-751.54
30	31	SCNTYM	N-2	004	353 030	322328	60742.82
32		NSCANS		037		No.Scans =	31 (decimal)

Scan N: 38 no. of words transferred = 182

Line Length, N-1: 000 277 360 377

Active Scan Time, N-1: 60743.94

Final Time, N: 60743.48

TELEMETRY

Byte No	Name	Contents	Pulses	Time(usec)
1	SYNC	246		
2	OPSTAT N	306	Bit 7 = 1: Scan N= Reverse	
3	SCNLIN N	250	-88	-16.58
4	TRNERR N	001 144	356	67.09
6	7 TORPLS N	357 320	-4144	-780.94
8	9 SHSERR N-1	000 013	11	2.07
10	11 FHSERR N-1	377 360	-16	-3.02
13	14 SUMERR N-1	377 357 325	-4139	-760.00
15	16 SCNCTR	000 132		
	17 SCNLIN N-1	130	88	16.58
18	19 TRNERR N-1	003 367	1015	191.28
20	21 TORPLS N-1	360 151	-3991	-752.11
22	23 SHSERR N-2	377 357	-17	-3.20
24	25 FHSERR N-2	000 015	13	2.45
27	28 SUMERR N-2	377 360 154	-3988	-751.54
30	31 SCNTYM N-2	004 353 035	322333	60743.77
32	NSCANS	037	No.Scans =	31 (decimal)

scan N: 39 no. of words transferred = 181

Line Length, N-1: 377 040 015 000

Active Scan Time, N-1: 60743.19

Final Time, N: 60742.73

TELEMETRY

Byte No	Name	Contents	Pulses	Time(usec)
1	SYNC	246		
2	OPSTAT N	106	Bit 7 = 0: Scan N= Forward	
3	SCNLIN N	130	88	16.58
4	5 TRNERR N	003 370	1016	191.47
6	7 TORPLS N	360 147	-3993	-752.48
8	9 SHSERR N-1	377 362	-14	-2.64
10	11 FHSERR N-1	000 015	13	2.45
13	14 SUMERR N-1	377 360 151	-3991	-752.11
15	16 SCNCTR	000 132		
	17 SCNLIN N-1	250	-88	-16.58
18	19 TRNERR N-1	001 144	356	67.09
20	21 TORPLS N-1	357 320	-4144	-780.94
22	23 SHSERR N-2	000 013	11	2.07
24	25 FHSERR N-2	377 360	-16	-3.02
27	28 SUMERR N-2	377 357 325	-4139	-780.00
30	31 SCNTYM N-2	004 353 036	322334	60743.95

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Appendix B
Scan Mirror Assembly Acceptance Test Data
Test Flow Event 1

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DATA SHEET 4.3.7-1
OPERABILITY CHECKS
AUTOMATIC TESTS

TS 32013-004

199

ATTACH TO DATA SHEET 4.3.7-1 OPERABILITY CHECKS AUTOMATIC TESTS

attach to data sheet 4.3.7-1 operability check; 2: report-FH, trk0, file2, rev121880

OPERABILITY CHECK
AUTOMATIC CHECK

SMA Designation: F-1 ACCEPT TEST
Serial Number: 4
Run Number: 30581.1446
Operation: SMC(1) SAM
Test Flow Event: L-1
Sequence Number: 6

TEMPERATURES
deg C
T1 (+2) 22.9
T2 (-2) 21.7
T3 (+X) 22.4
T4 (-X) 22.7
T5 (BRDG) (SAM) 23.9
T6 (SME) 26.7
T7 (-2-X) 20.5
T8 (+2+R) 20.6
T9

SMA POWER SUPPLIES
+27
-27
-6.8
measured LOW
27.5
-27.4
6.2
supply rms volts
28 to 30
-28 to -30
6.3 to 7.7
measured mamps
31.1
24.4
2274.3
spec mamps
200
200
2500
P/F
P
P
P

BILEVEL DIGITAL
TELEMETRY, volts
SME(1) ON 4.3
SME(2) ON 0.2
SAM(1)/BUMPER(2) 3.8

MODE
SME(1), SAM

PRESSURE, torr
1.1
req'd <= 2

TORQUE PULSES, usec
(100 scans) TAU A 763.5
TAU B 753.9
mean
sigma
0.3
0.3
req'd
600 to 1000
600 to 1000
P
P

ACTIVE SCAN TIME, usec
(100 scans) combined mean
60742.9
60742.8
to 60743.2
sigma
0.3
req'd
2.9
P
P

TURN-ON TIME, sec
(time to reach within 10usec of active scan time)
8.9
spec <= 60
P

Tested By

70

85

84 Stamp

84 Stamp

ORIGINAL PAGE IS
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Date Date: 11/25/81 Date Time: 1446

SMA Designation: F-1 ACCEPT TEST
Serial Number: 4
Run Number: 30581.1446
Test Flow Event: L
Sequence Number: 6

SAM MODE operation

scan N: 99 no. of words transferred = 32

Line Length, N-1: 377 020 023 000
Active Scan Time, N-1: 60742.25
Final Time, N: 60742.92

TELEMETRY

Byte No	Name	Contents	Pulses	Time(usec)
1	SYNC	200		
2	OPSTAT N	006	Bit 7 = 0: Scan N= Forward	
3	SCNLIN N	130	88	16.58
4 5	TRNERR N	003 265	949	178.84
6 7	TORPLS N	360 143	-3997	-753.24
8 9	SHSERR N-1	377 361	-15	-2.83
10 11	FHSERR N-1	000 023	19	3.58
12 13 14	SUMERR N-1	377 360 140	-4000	-753.80
15 16	SCNCTR	003 334		
17	SCNLIN N-1	250	-88	-16.58
18 19	TRNERR N-1	001 120	336	63.32
20 21	TORPLS N-1	360 053	-4053	-763.79
22 23	SHSERR N-2	000 022	18	3.39
24 25	FHSERR N-2	377 357	-17	-3.20
26 27 28	SUMERR N-2	377 360 053	-4053	-763.79
29 30 31	SCNTYM N-2	004 353 030	322328	60742.82
32	NSCANS	037	No.Scans =	31 (decimal)

scan N:100 no. of words transferred = 31

Line Length, N-1: 001 077 357 377
Active Scan Time, N-1: 60742.62
Final Time, N: 60742.92

TELEMETRY

Byte No	Name	Contents	Pulses	Time(usec)
1	SYNC	200		
2	OPSTAT N	206	Bit 7 = 1: Scan N= Reverse	
3	SCNLIN N	250	-88	-16.58
4 5	TRNERR N	001 117	335	63.13
6 7	TORPLS N	360 056	-4050	-763.22
8 9	SHSERR N-1	000 023	19	3.58
10 11	FHSERR N-1	377 357	-17	-3.20
12 13 14	SUMERR N-1	377 360 055	-4051	-763.41
15 16	SCNCTR	003 335		
17	SCNLIN N-1	130	88	16.58
18 19	TRNERR N-1	003 265	949	178.84
20 21	TORPLS N-1	360 143	-3997	-753.24
22 23	SHSERR N-2	377 361	-15	-2.83
24 25	FHSERR N-2	000 023	19	3.58
26 27 28	SUMERR N-2	377 360 140	-4000	-753.80
29 30 31	SCNTYM N-2	004 353 025	322325	60742.26
32	NSCANS	037	No.Scans =	31 (decimal)

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TS 32015-0045
Rev. B

DATA SHEET 4.3.7-2: OPERABILITY CHECKS

Manual Tests

SMA Designation F-1 S/N 4 SWE(1) (M) ✓ SWE(2) (M)

Step

(a)

MUX Pulse Interfaces

Place check in blocks indicated after observing the waveforms (see Figure 4.3-12). The signal low should be 40 ± 40 m volts, and the signal high should be 600 ± 40 m v. The pulse duration should be from 300 μ sec to 400 μ sec. (For Pseudo SWS just confirm their presence with a check)

SIGNAL	SWITCH POSITION	WORN	SWITCH POSITION	COMPLEMENT	PSEUDO (40 μ sec)
Pulses	3 or 7	✓	4 or 8	✓	✓
Direction	1 or 5	✓	2 or 6	✓	✓

(b)

"SWE 1 ON MUX":

IF SWE (1) is ON (✓)

IF SWE (2) is ON (✓)

Logic 1

4.5 to 5.5 volts ✓

Logic 0

0 to 0.8 volt Pass ✓ Fail

MAC
TEST
J4

Date 3/5/81 QA Stamp

Test Flow Event L

Tested by F

Comments

No. Req'd = 20

ORIGINAL PAGE IS
OF POOR QUALITY

DATA SHEET 4.3.7-1
OPERABILITY CHECKS
AUTOMATIC TESTS

TS 32015-004

ATTACH TO DATA SHEET 4.3.7-1 OPERABILITY CHECKS - AUTOMATIC CHECKS
SUG...

attach to data sheet 4.3.7-1 operability check, 2 tape AT-FM, trk 0, file 2, rev 12181

OPERABILITY CHECK
AUTOMATIC CHECK

SMA Designation: F-1 ACCEPT TEST
Serial Number: 4
Run Number: 30581.1452
Operation: SME(1) BUMPER
Test Flow Event: L-3
Sequence Number: 6

TEMPERATURES
deg C
T1 (+2) 22.9
T2 (-2) 21.7
T3 (+X) 22.4
T4 (-X) 22.7
T5 (BRDG) 22.9
T6 (SAM) 23.9
T7 (SME) 26.7
T8 (-2-X) 20.5
T9 (+2-X) 20.6

SMA POWER SUPPLIES
+27
-27
-6.8
measured LOW
27.5
-27.4
6.2
supply rms volts
28 to 30
-28 to -30
6.3 to 7.7
measured WATTS
29.4
27.2
2260.8
spec WATTS
200
200
2500
P/F
P
P
P

BILEVEL DIGITAL
TELEMETRY, volts
SME(1) ON 4.3
SME(2) ON 0.4
SAM(1)/BUMPER(2) 0.2

MODE
SME(1), BUMPER

PRESSURE, torr
1.2
req'd <= 2

TORQUE PULSES, usec
(100 scans)
TAU A
TAU B
mean
887.3
881.5
sigma
0.9
0.8
req'd

BUMPER-BUMPER TIME, usec combined
(100 scans)
mean
71342.9
sigma
71342.2
71343.8
req'd
0.7
2.9
P
P

TURN-ON TIME, sec
(time to reach within 10 usec of active scan time)
7.9
spec <= 60

Tested by

GA

ORIGINAL PAGE IS
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Date: 11-11-61 Time: 11:41:14

Serial Number: 1-1 ACCEPT TEST

Serial Number: -

Run Number: 30581.1452

Flow Event: L

Sequence Number: 6

BUMPER MODE operation

Scan N: 99 no. of words transferred = 32

Line Length, N-1: 005 306 331 000

Bumper to Bumper Time, N-1: 71344.5

Final Time, N: 60743.11

TELEMETRY

Byte No	Name	Contents	Pulses	Time(μsec)
1	SYNC	200		
2	OPSTAT N	046	Bit 7 = 0: Scan N= Forward	
3	SONLIN N	130	88	16.58
4	TRNERR N	000 000	0	0.00
5	TORPLS N	355 270	-4680	-891.95
6	SHSERR N-1	000 000	0	0.00
7	FHSERR N-1	000 000	0	0.00
8	SUMERR N-1	377 355 276	-4674	-880.92
9	SONCTR	003 245		
10	SONLIN N-1	250	-88	-16.58
11	TRNERR N-1	000 000	0	0.00
12	TORPLS N-1	357 113	-4277	-806.00
13	SHSERR N-2	000 000	0	0.00
14	FHSERR N-2	000 000	0	0.00
15	SUMERR N-2	377 357 104	-4284	-807.32
16	SONCTY N-2	004 353 017	322319	60741.13
17	NSCANS	037	No.Scans =	31 (decimal)

Scan N: 100 no. of words transferred = 31

Line Length, N-1: 005 306 321 377

Bumper to Bumper Time, N-1: 71343.0

Final Time, N: 60743.11

TELEMETRY

Byte No	Name	Contents	Pulses	Time(μsec)
1	SYNC	200		
2	OPSTAT N	246	Bit 7 = 1: Scan N= Reverse	
3	SONLIN N	250	-88	-16.58
4	TRNERR N	000 000	0	0.00
5	TORPLS N	357 100	-4288	-808.00
6	SHSERR N-1	000 000	0	0.00
7	FHSERR N-1	000 000	0	0.00
8	SUMERR N-1	377 357 100	-4288	-808.00
9	SONCTR	003 245		
10	SONLIN N-1	130	88	16.58
11	TRNERR N-1	000 000	0	0.00
12	TORPLS N-1	355 270	-4680	-891.95
13	SHSERR N-2	000 000	0	0.00
14	FHSERR N-2	000 000	0	0.00
15	SUMERR N-2	377 355 276	-4674	-880.92
16	SONCTY N-2	004 353 041	322337	60744.52
17	NSCANS	037	No.Scans =	31 (decimal)

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TS 32015-0004
Rev. B

DATA SHEET 4.3.7-2: OPERABILITY CHECKS

Manual Tests

SPL Designation F-1 S/R 2 SNE(1) ON ✓ SNE(2) ON ✓
Step 3a pr.

(a)

MUX Pulse Interfaces

Place check in blocks indicated after observing the waveform (see Figure 4.3-12). The signal low should be 40 ± 40 mV, and the signal high should be 600 ± 40 mV. The pulse duration should be from 300 μ sec to 400 μ sec. (For Pseudo SAMS just confirm their presence with a check)

SIGNAL	SWITCH POSITION	WORM	SWITCH POSITION	COMPLEMENT	PSEUDO (40 μ sec)
Pulses	3 or 7	✓	4 or 6	✓	✓
Direction	1 or 5	✓	2 or 8	✓	✓

(b)

"SME 1 ON MUX":

IF SME (1) is ON (✓)

IF SME (2) is ON (✓)

Logic 1

4.5 to 5.5 volts ✓

Logic 0

0 to 0.9 volt Pass Fail



Date 3/5/81 QA Stamp _____

Test Flow Event L Tested by [Signature]

Comments _____

No. Req'd = 20

ORIGINAL PAGE IS
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DATA SHEET 4.3.7-1
OPERABILITY CHECKS
AUTOMATIC TESTS

TS 32015-004

ATTACH TO DATA SHEET 4.3.7-1 OPERABILITY CHECKS - AUTOMATIC TESTS

attach to data sheet 4.3.7-1 operability check; 2; tape AT-FH, trk 0, file 2; rev 121820

OPERABILITY CHECK AUTOMATIC CHECK

SMA Designation: F-1 ACCEPT TEST
Serial Number: 4
Run Number: 30581.1458
Operation: SNE(2) SAM
Test Flow Event: L-5
Sequence Number: 6

TEMPERATURES
deg C

T1	T2	T3	T4	T5	T6	T7	T8	T9
(+2)	(-2)	(+X)	(-X)	(BRDG)	(SHH)	(SME)	(-2-X)	(+2+X)
22.9	21.7	22.4	22.7	22.9	23.8	26.6	20.4	20.6

SMA POWER SUPPLIES

measured	supply rms	measured	spec	P/F
LOW	volts	amps	amps	
+27	28 to 30	27.8	200	P
-27	-28 to -30	26.5	200	P
-6.8	6.3 to 7.7	2292.1	2500	P

BILEVEL DIGITAL
TELEMETRY, volts

SME(1) ON	SME(2) ON	SAM(1)/BUMPER(2)
0.4	4.3	0.2

MODE
SME(2), SAM

PRESSURE, torr

1.2	req'd (<= 2)

TORQUE PULSES, usec
(100 scans) TAU A
TAU B

mean	sigma	req'd
760.6	0.2	600 to 1000
753.7	0.3	600 to 1000

ACTIVE SCAN TIME, usec
(100 scans)

combined	mean	sigma	req'd
60742.9	60742.8	0.3	2.9
	to 60743.2		

TURN-ON TIME, sec
(time to reach within 10usec of active scan time)

13.0	spec (<= 60)

Tested by

QA Stamp

05 Aug 69 - 21

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Date Date: 62858: Data Time: 1458

SAR Designation: F-1 ACCEPT TEST
Serial Number: 4
Run Number: 30581.1458
Test Flow Event: L
Sequence Number: 6

SAR MODE operation

scan N: 99. no. of words transferred = 32

Line Length,N-1: 377 020 023 000
Active Scan Time,N-1: 60742.25
Final Time,N: 60743.30

TELEMETRY

Byte No	Name	Contents	Pulses	Time(usec)
1	SYNC	246		
2	OPSTAT N	106		
3	SCNLIN N	130	88	16.58
4 5	TRNERR N	003 325	981	184.87
6 7	TORPLS N	360 145	-3995	-752.86
8 9	SHSERR N-1	377 361	-15	-2.83
10 11	FHSERR N-1	000 023	19	3.58
12 13 14	SUMERR N-1	377 360 142	-3998	-753.42
15 16	SCNCTR	003 350		
17	SCNLIN N-1	250	-88	-16.58
18 19	TRNERR N-1	001 200	384	72.36
20 21	TORPLS N-1	360 075	-4035	-760.40
22 23	SHSERR N-2	000 013	11	2.07
24 25	FHSERR N-2	377 370	-8	-1.51
26 27 28	SUMERR N-2	377 360 074	-4036	-760.59
29 30 31	SCNTYM N-2	004 353 026	322326	60742.45
32	NSCANS	037	No.Scans =	31 (decimal)

scan N:100 no. of words transferred = 31

Line Length,N-1: 000 237 367 377
Active Scan Time,N-1: 60743.00
Final Time,N: 60743.86

TELEMETRY

Byte No	Name	Contents	Pulses	Time(usec)
1	SYNC	246		
2	OPSTAT N	306		
3	SCNLIN N	250	-88	-16.58
4 5	TRNERR N	001 177	383	72.18
6 7	TORPLS N	360 076	-4034	-760.21
8 9	SHSERR N-1	000 011	9	1.70
10 11	FHSERR N-1	377 367	-9	-1.70
12 13 14	SUMERR N-1	377 360 076	-4034	-760.21
15 16	SCNCTR	003 351		
17	SCNLIN N-1	130	88	16.58
18 19	TRNERR N-1	003 325	981	184.87
20 21	TORPLS N-1	360 145	-3995	-752.86
22 23	SHSERR N-2	377 361	-15	-2.83
24 25	FHSERR N-2	000 023	19	3.58
26 27 28	SUMERR N-2	377 360 142	-3998	-753.42
29 30 31	SCNTYM N-2	004 353 025	322325	60742.26
32	NSCANS	037	No.Scans =	31 (decimal)

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TS 32015-2245
Rev. B

DATA SHEET 4.3.7-2: OPERABILITY CHECKS

Manual Tests

SMA Designation F-1 S/N 4 SWE(1) (M) SWE(2) (M) ✓

Step

(a)

MUX Pulse Interfaces

Place check in blocks indicated after observing the waveform (see Figure 4.3-12). The signal low should be 40 ± 40 m volts, and the signal high should be 650 ± 45 mV. The pulse duration should be from 300 μ sec to 400 μ sec. (For Pseudo SWS just confirm their presence with a check)

SIGNAL	SWITCH POSITION	NOISE	SWITCH POSITION	COMPLEMENT	PSEUDO (45-75 sec)
Pulses	3 or 7	✓	4 or 8	✓	✓
Direction	1 or 5	✓	2 or 6	✓	✓

(b)

"SWE 1 ON MUX":

IF SWE (1) is ON (M)

IF SWE (2) is ON (M)

Logic 1

4.5 to 5.5 volts

Logic 0

0 to 0.8 volt ✓ Pass ✓ Fail

Date 3/5/81 QA Stamp

Test Flow Event 4

Tested by [Signature]

Comments

ORIGINAL PAGE IS
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DATA SHEET 4.3.7-1
OPERABILITY CHECKS
AUTOMATIC TESTS

TS 32015-004

attach to data sheet 4.3.7-1 operability check, 2 tape RT-FN, trk 0, file 2, rev 1218

OPERABILITY CHECK AUTOMATIC CHECK

SMA Designation: F-1 ACCEPT TEST
Serial Number: 4
Run Number: 30581.1504
operation: SME(2) BUMPER
Test Flow Event: L-7
Sequence Number: 6

TEMPERATURES	T1	T2	T3	T4	T5	T6	T7	T8	T9
	(+Z)	(-Z)	(+X)	(-X)	(BRDG)	(SAM)	(SME)	(-Z-X)	(+Z+)
deg C	22.8	21.7	22.4	22.7	22.9	23.7	26.5	20.4	20.6

SMA POWER SUPPLIES	measured	supply rms	measured	spec	P/F
	LOW	volts	watts	watts	
+27	27.5	28 to 30	28.5	200	P
-27	-27.4	-28 to -30	27.2	200	P
-6.8	6.2	6.3 to 7.7	2285.5	2500	P

BILEVEL DIGITAL
TELEMETRY, volts

SME(1) ON	SME(2) ON	SAM(1)/BUMPER(2)
0.3	4.3	3.8

MODE
SME(2), BUMPER

PRESSURE, torr

1.3	req'd <= 2

TORQUE PULSES, usec
(100 scans)

mean	sigma	req'd
771.7	0.9	---
910.9	0.7	---

BUMPER-BUMPER TIME, usec combined
(100 scans)

mean	sigma	req'd
71342.9	71342.2	2.9
to 71343.8	0.8	

TURN-ON TIME, sec
(time to reach within 10usec of active scan time)

7.9	spec <= 60

Tested by

GA STOP

TS 32015-004

Data Date: 030581 Data Time: 1504

ORIGINAL PAGE 13
OF POOR QUALITY

SP3 Designation: F-1 ACCEPT TEST
 Serial Number: 4
 Run Number: 30581.1504
 Test Flow Event: L
 Sequence Number: 6

BUMPER MODE operation

Scan N: 99 no. of words transferred = 32

Line Length, N-1: 005 306 325 000
 Bumper to Bumper Time, N-1: 71343.7
 Final Time, N: 60743.11

TELEMETRY

Byte No	Name	Contents	Pulses	Time(ussec)
1	SYNC	246		
2	OPSTAT N	146	Bit 7 = 0: Scan N= Forward	
3	SCN LIN N	130	88	16.38
4	5 TRNERR N	000 000	0	0.00
6	7 TORPLS N	353 032	-4838	-911.72
8	9 SHSERR N-1	000 000	0	0.00
10	11 FHSERR N-1	000 000	0	0.00
12	13 14 SUMERR N-1	377 353 035	-4835	-911.16
15	16 SCNCTR	003 200		
17	SCN LIN N-1	250	-88	-16.38
18	19 TRNERR N-1	000 000	0	0.00
20	21 TORPLS N-1	360 000	-4896	-771.09
22	23 SHSERR N-2	000 000	0	0.00
24	25 FHSERR N-2	000 000	0	0.00
26	27 28 SUMERR N-2	377 360 003	-4893	-771.33
29	30 31 SCNTYM N-2	004 353 035	322333	60743.77
32	NSCANS	037	No.Scans =	31 (decimal).

Scan N: 100 no. of words transferred = 31

Line Length, N-1: 005 306 315 377
 Bumper to Bumper Time, N-1: 71342.2
 Final Time, N: 60743.11

TELEMETRY

Byte No	Name	Contents	Pulses	Time(ussec)
1	SYNC	246		
2	OPSTAT N	346	Bit 7 = 1: Scan N= Reverse	
3	SCN LIN N	250	-98	-16.38
4	5 TRNERR N	000 000	0	0.00
6	7 TORPLS N	360 004	-4892	-771.14
8	9 SHSERR N-1	000 000	0	0.00
10	11 FHSERR N-1	000 000	0	0.00
12	13 14 SUMERR N-1	377 360 001	-4895	-771.70
15	16 SCNCTR	003 200		
17	SCN LIN N-1	130	88	16.38
18	19 TRNERR N-1	000 000	0	0.00
20	21 TORPLS N-1	353 032	-4838	-911.72
22	23 SHSERR N-2	000 000	0	0.00
24	25 FHSERR N-2	000 000	0	0.00
26	27 28 SUMERR N-2	377 353 035	-4835	-911.16
29	30 31 SCNTYM N-2	004 353 035	322333	60743.77
32	NSCANS	037	No.Scans =	31 (decimal)

ORIGINAL PAGE IS
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TS 32015-4048
Rev. B

DATA SHEET 4.3.7-2: OPERABILITY CHECKS

Manual Tests

SMA Designation F-1 S/N Y SHE(1) (M) SHE(2) (M) ✓
Step Brpt

(a)

MUX Pulse Interfaces

Place check in blocks indicated after observing the waveforms (see Figure 4.3-12). The signal low should be 40 ± 40 mV, and the signal high should be 650 ± 40 mV. The pulse duration should be from 300 μ sec to 400 μ sec. (For Pseudo SAMS just confirm their presence with a check)

SIGNAL	SWITCH POSITION	NORM	SWITCH POSITION	COMPLEMENT	PSEUDO (40 μ sec)
Pulses	3 or 7	✓	4 or 8	✓	✓
Direction	1 or 5	✓	2 or 6	✓	✓

(b)

"SHE 1 ON MUX":

If SHE (1) is ON (✓)

If SHE (2) is ON (✓)

Logic 1

4.5 to 5.5 volts

Logic 0

0 to 0.8 volt ✓ Pass ✓ Fail

Date 3/3/81 QA Stamp

Test Flow Event 6 Tested by [Signature]

Comments

ORIGINAL PAGE IS
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DATA SHEET 4.3.8-1
OPERATIONAL PERFORMANCE
SCAN TO SCAN REPEATABILITY

TS 32015-004
8 March 1990

SMA Designation F-1 ACCEPT TEST

3/78: 4

SIN RISE

SMB (1) or (2):

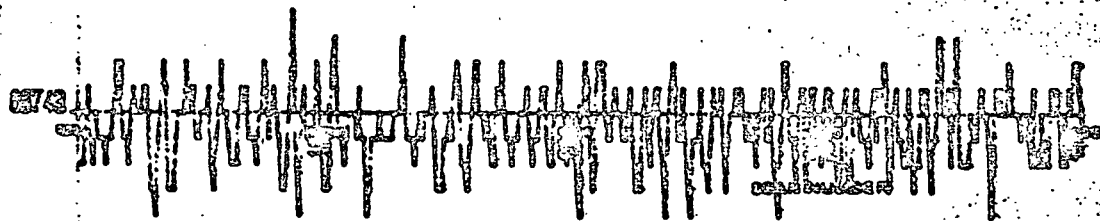
Voltage: High __, Nom __, Low __

27.5 -27.4 12

480 CONSECUTIVE
1000 PWD, 500 REV

28 PM
29 PM

ACTIVE SCAN TIME, USEC



	CLOCK-CORRECTED LINE-LENGTH, USEC					
	MEAN	EPIC	P/P	JNE-SHOMA	EPIC	P/P
PWD	27.2	27.3	P	1.2	0 TO 2.0	P
REV	27.2	27.3	P	1.2	0 TO 2.0	P

Run No. 3331.1519

Test Flow Event L-9 629 8

Comments test no. 9

QC Stamp

Tested By

Date

3/5/81

ORIGINAL PAGE IS
OF POOR QUALITY

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DATA SHEET A382
OPERATIONAL PERFORMANCE

SS 82015-000

Rev 3

attach to data sheet 4.3.5-2

400scan parameter, tape AT, rev1218

OPERATIONAL PERFORMANCE
SCAN PARAMETERS

SMA Designation: F-1 ACCEPT TEST

Serial Number: 4

Run Number: 30591.1519

operation: SME(1) SAM

Test Flow Event: L-9 Sea 6

Voltages: 27.5 -27.4 6

temperatures	T1	T2	T3	T4	T5	T6	T7	T8	T9
	(+Z)	(-Z)	(+X)	(-X)	(BRDG)	(SAM)	(SME)	(-Z-X)	(+Z+X)
deg C	22.8	21.7	22.3	22.7	22.9	23.9	26.8	20.4	20.5

SCAN PARAMETER(400 scans)	MEASURED	REQUIREMENT	SPECIFICATION	P/F
---------------------------	----------	-------------	---------------	-----

clock freq, HZ	10612841	10612875	+/-125	P
----------------	----------	----------	--------	---

torque pulse width, usec

mean	760	<1100	P
sigma	5		P

turn-around time, usec

bumper A: mean	10656.0	10590	+/- 68	P
----------------	---------	-------	--------	---

sigma	0.1		P
-------	-----	--	---

bumper B: mean	10540.1		P
----------------	---------	--	---

sigma	0.2		P
-------	-----	--	---

active scan time, usec

fwd: min	60742.2		
----------	---------	--	--

max	60743.6		
-----	---------	--	--

mean	60742.9		
------	---------	--	--

sigma	0.3		
-------	-----	--	--

rev: min	60742.2		
----------	---------	--	--

max	60743.8		
-----	---------	--	--

mean	60742.9		
------	---------	--	--

sigma	0.3		
-------	-----	--	--

combine: mean	60742.9	60743	+/-0.2
---------------	---------	-------	--------

sigma	0.3	<2.9	P
-------	-----	------	---

scan period, usec	142681.9	142666	+/-140
-------------------	----------	--------	--------

scan rate var, percent

fwd: min	-0.001		+/-1
----------	--------	--	------

max	0.001		P
-----	-------	--	---

rev: min	-0.001		P
----------	--------	--	---

max	0.001		P
-----	-------	--	---

SAM offset(P0 mean), urad -2.60

line start pulse angular

jitter(P0 sigma), urad	0.31	<1.00	P
------------------------	------	-------	---

SAM angle, urad

fwd: mean	134547		
-----------	--------	--	--

sigma	0.32	<1	P
-------	------	----	---

rev: mean	134545		
-----------	--------	--	--

sigma	0.36	<1	P
-------	------	----	---

Tested by

na

Temperatures and Voltages

Ch	Scanner C.A	Device	Col	Measurement
4	1.2332E 03	SMA -2	1	21.651 Deg C
12	9.5788E 03	MF(-2-X)	3	20.427 Deg C
13	9.5563E 03	MF(+2-X)	3	20.604 Deg C

Data: 030581

Time: 1519

Bit Designation: F-1 ACCEPT TEST

Serial Number: 4

Run Number: 30581.1519

Test Flow Event: L

Test Number: 9

Sequence Number: 6

Pressure: 1.25E 00 TORR

ORIGINAL PAGE IS
OF POOR QUALITY

INITIALIZE

Words Transferred: 4

Word Number 0: INTERRUPT (Raw 177771 Octal)

Bit	Description	Setting
0	Panel Mode	1
1	Calibrate Mode	0
2	Scan Mode	0

Word Number 1: PANEL STATUS (Raw 042402 Octal)

Bit	Description	Setting
0	Bumper SW On	0
1	Beq SAM P0/P3	1
2	Beq SAM P2/P5	0
3	Beq SAM PA/PE	0
4	Processed SAM	1
4.5	Raw SAM	0
4.5	SAM 1 or SAM 2	0
4.5	SAM 3 (CAL SAM)	0
6	Single Reset	0
7	End SAM P0/P3	0
8	End SAM P2/P5	1
9	End SAM PA/PE	0
10	Ext Reset	1
11	5 Facet	0
12	Calibrate Mode	0
13	Scan Mode	0
14	Initialize Mode	1
15	Slow Telemetry Mode	0

Word Numbers 2 and 3: (Raw 000000 007157 Octal)

Scan Count Preset:	7157 Octal	No. of Scans:	400
Time Count Preset:	0000000	No. of Samples:	0

Number of Scans of S\$ Dimensions: 400

Dimension of S\$ Array: 15226

Dimension of W\$ Array: 800

CALIBRATE: SAM/SME: 1

Facet	IFAR Counts	Preset Angles	No. a, b
P0P5	0.00	-6.7170900E-02	1.6392000E 05
P1P4	163920.00	0.0000000E 00	2.4423910E 05
P2P3	327840.00	6.7159200E-02	-1.2645252E 04

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OF POOR QUALITY

Number B: 0.00

Temperatures and Voltages

CH	Scanner Out	Device	Cal	Measurement
3	-1.8000E-04	QUARTER	3	ERROR
1	2.7778E-02	EU=6.8I	5	2277.600 mAmps
2	1.4440E-03	EU=+27I	5	29.880 mAmps
3	-1.2778E-03	EU=-27I	5	25.540 mAmps
4	2.2914E-03	SMA -Z	1	21.672 Deg C
5	2.2933E-03	SMA -X	1	22.681 Deg C
6	2.1932E-03	SMA +Z	1	22.797 Deg C
7	2.2329E-03	SMA +X	1	22.341 Deg C
8	2.1854E-03	TORQ BRDG	1	22.887 Deg C
9	9.3755E-02	SME TEMP	2	26.797 Deg C
10	2.0940E-03	SAM TEMP	1	23.934 Deg C
11	6.2178E-00	EU=6.8V	4	6.218 Volts
12	9.5793E-03	MF(-Z-X)	3	20.423 Deg C
13	9.5638E-03	MF(+Z+X)	3	20.545 Deg C
14	4.3349E-00	SME(1)TEL	4	4.335 Volts
15	2.3734E-01	SME(2)TEL	4	0.237 Volts
16	-1.0000E-04	SME PR U7	3	ERROR
17	3.8221E-00	SAM1/BMP2	4	3.822 Volts
18	2.7483E-01	EU=+27V	4	27.483 Volts
19	-2.7356E-01	EU=-27V	4	-27.356 Volts

IF 'ERROR 60' OCCURS DURING MARKING OF TAPE:

type:sto REMARK---press execute--press continue

Data Tape Identifier: F1D7
Track for Data: 0
Init/Cal Data File Number: 7
Scan Data File Number: 8

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DATA SHEET 4.3.5-1
OPERATIONAL PERFORMANCE
SCAN TO SCAN REPEATABILITY

TS 32015-004
8 March 1980

SMA Designation: F-1 ACCEPT TEST

S/N: 4

REPEL RIDE

1

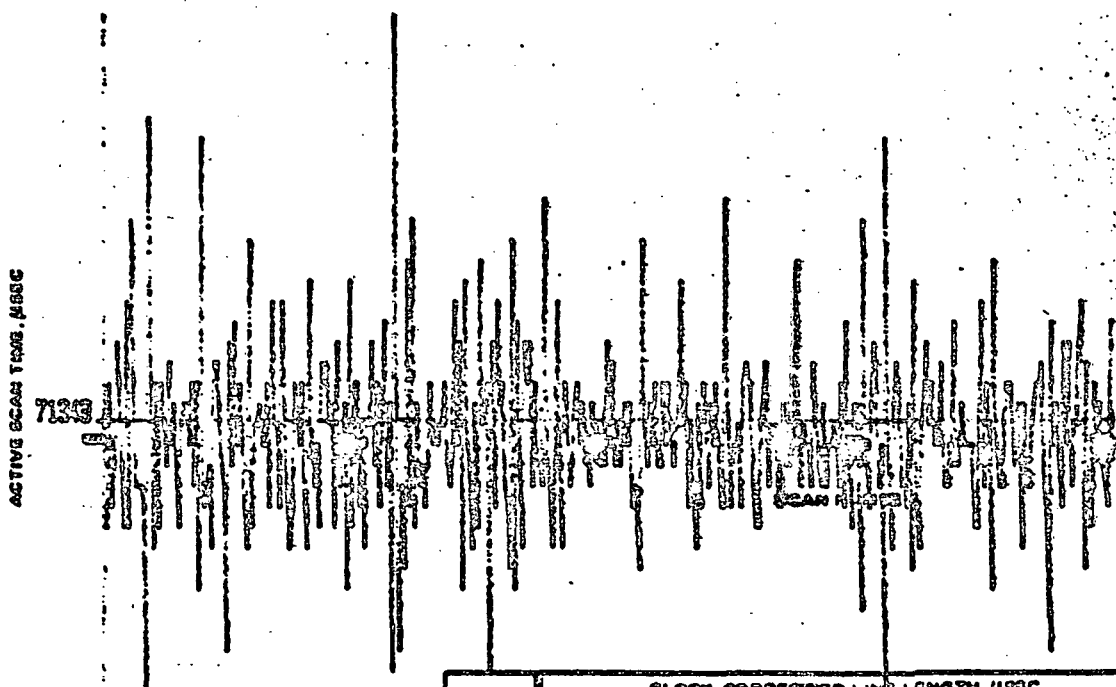
SMS (1) or (2):

Voltage: High Nom Low

27.5 -27.4 0.2

400 CONSECUTIVE
(320 PWD, 320 REV)

20 PD
20 REV



	CLOCK-CORRECTED LINE LENGTH, μSEC					
	MEAN	SPEC	P/P	ONS-SIGMA	SPEC	P/P
PWD	7132.0	7133 -1	P	0.78	0.70 2.0	P
REV	7132.07	7133 -1.0	P	0.81	0.70 2.0	P

Run No. 3331.157

Test Flow Event L-11 seq 8

Comments test no. 11

QC Stamp

Date

Tested By

TEST
JAN

3/5/84

[Signature]

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DATA SHEET 4253
OPERATIONAL PERFORMANCE
SCAN PARAMETERS

TS 32015-004

Rev 3

attach to data sheet 4.3.5-2 400scan parameter tape AT, rev 121880

OPERATIONAL PERFORMANCE
SCAN PARAMETERS

SMA Designation: F-1 ACCEPT TEST
Serial Number: 4
Run Number: 30581.1527
temperatures T1 T2 T3 T4 T5 T6 T7 T8 T9
(+Z) 22.8 21.7 22.3 22.7 (-X) (BRDG) (SAM) (SME) (-Z-X) (+Z+X)
deg C 22.8 21.7 22.3 22.7 22.9 23.9 26.8 20.4 20.5

SCAN PARAMETER (400 scans) MEASURED REQUIREMENT SPECIFICATION P/F

clock freq, HZ 10612841 10612875 +-125 P

torque pulse width, usec
mean 846
sigma 37 <1100 P

bumper to bumper time, usec
fwd: min 71340.7
max 71346.7
mean 71342.9
sigma 0.8
rev: min 71340.5
max 71345.6
mean 71342.9
sigma 0.8
combine: mean 71342.9
sigma 0.8
scan period, usec 142685.8 71343 +-0.8 P
142686 +-1.6 P P

scan rate var, percent
fwd: min -0.003
max 0.005
rev: min -0.003
max 0.004

Temperatures and Voltages

Scan	Scanner	Device	Col	Measurement
4	2.254E 03	SMA -Z	1	21.635 Deg C
12	9.5796E 03	MF(-Z-X)	3	20.421 Deg C
3	9.5641E 03	MF(+Z-X)	3	20.543 Deg C

Date: 030581

Time: 1527

Mission Designation: F-1 ACCEPT TEST
 Serial Number: 4
 Run Number: 30581.1527
 Test Flow Event: L
 Test Number: 11
 Sequence Number: 6
 Pressure: 1.40E 00 TORR

ORIGINAL PAGE IS
OF POOR QUALITY

INITIALIZE

Words Transferred: 4

Word Number 0: INTERRUPT (Raw 177771 Octal)

Bit	Description	Setting
0	Panel Mode	1
1	Calibrate Mode	0
2	Scan Mode	0

Word Number 1: PANEL STATUS (Raw 042402 Octal)

Bit	Description	Setting
0	Bumper SW On	0
1	See SAM P0/P3	1
2	See SAM P2/P5	0
3	See SAM PA/PB	0
45	Processed SAM	1
45	Raw SAM	0
45	SAM 1 or SAM 2	0
45	SAM 3 (CAL SAM)	0
6	Single Reset	0
7	End SAM P0/P3	0
8	End SAM P2/P5	1
9	End SAM PA/PE	0
10	Ext Reset	1
11	5 Facet	0
12	Calibrate Mode	0
13	Scan Mode	0
14	Initialize Mode	1
15	Slow Telemetry Mode	0

Word Numbers 2 and 3: (Raw 000000 007157 Octal)

Scan Count Preset:	7157 Octal	No. of Scans:	400
Time Count Preset:	0000000	No. of Samples:	0

Number of Scans of S\$ Dimension: 400
 Dimension of S\$ Array: 15226
 Dimension of W\$ Array: 800

CALIBRATE: SAM/SME: 1

Facet	IFAR Counts	Preset Angles	No. a, b
P0P5	0.00	-6.7170900E-02	1.6392000E 05
P1P4	163526.00	0.0000000E 00	2.4423910E 06
P2P3	327840.00	6.7159200E-02	-1.2645252E 04

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OF POOR QUALITY

Temperatures and Voltages

Ch	Spanner Out	Device	Cal	Measurement
0	-1.0000E-04	QUARTER	0	ERROR
1	2.2691E-02	EU=6.81	5	2269.100 mAmps
2	1.5276E-03	EU=+27I	5	30.540 mAmps
3	-1.3106E-03	EU=-27I	5	26.360 mAmps
4	2.2925E-03	SMA -Z	1	21.659 Deg C
5	2.2094E-03	SMA -X	1	22.680 Deg C
6	2.1402E-03	SMA +Z	1	22.797 Deg C
7	2.2338E-03	SMA +X	1	22.334 Deg C
8	2.1754E-03	TORQ BRDC	1	22.887 Deg C
9	9.3493E-02	SME TEMP	2	26.818 Deg C
10	2.0441E-03	SAM TEMP	1	23.933 Deg C
11	6.2134E-00	EU=6.8V	4	6.213 Volts
12	9.5799E-03	MF(-Z-X)	3	20.418 Deg C
13	9.5648E-03	MF(+Z+X)	3	20.541 Deg C
14	4.3356E-00	SME(1)TEL	4	4.336 Volts
15	4.2063E-01	SME(2)TEL	4	0.421 Volts
16	-1.0000E-04	SME PR U7	3	ERROR
17	1.7911E-01	SAM1/BMP2	4	0.179 Volts
18	2.7483E-01	EU=+27V	4	27.483 Volts
19	-2.7355E-01	EU=-27V	4	-27.355 Volts

=====

IF 'ERROR 80' OCCURS DURING MARKING OF TAPE:

type:to REMARK---press execute---press continue

=====

Data Tape Identifier:

rack for Data:

Initial Data File Number:

Scan Data File Number:

F107

0

9

10

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DATA SHEET 4.3.6-3
OPERATIONAL PERFORMANCE
ALONG SCAN GEOMETRIC REPEATABILITY

TS 32015-004
8 March 1980

SMA Designation F-1 ACCEPT TEST S/N 4

SAN WIDE (and calibrated)

Voltage: High, Nom, Low

IPAR COUNTS:

CALIBRATION

BUMPER A

P2 P3

MID - P1 P4

P5 P6

BUMPER B

SCANNING

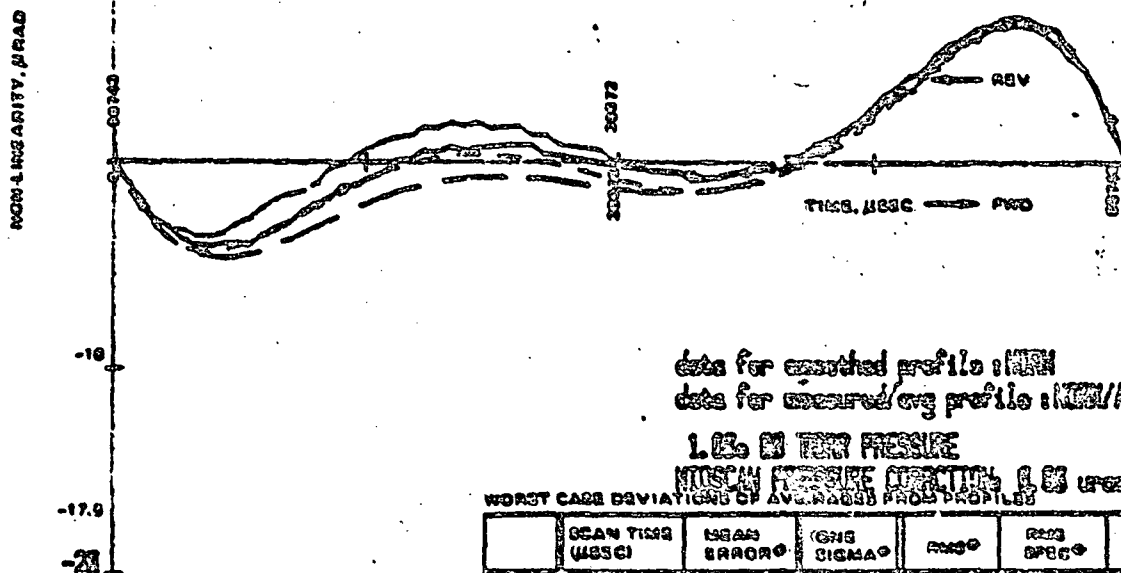
SAN FEET, GRAD

MEAN VALUES	P2	P3	P4	P5	P6	LAST P6
24	24	24	24	24	24	24
62	62	62	62	62	62	62
30	30	30	30	30	30	30
28	28	28	28	28	28	28
17.0	17.0	17.0	17.0	17.0	17.0	17.0
10	10	10	10	10	10	10
-10	-10	-10	-10	-10	-10	-10
-17.0	-17.0	-17.0	-17.0	-17.0	-17.0	-17.0
-20	-20	-20	-20	-20	-20	-20

TEMP: T1 T2 T3 T4 T5 T6 T7 T8 T9 T10 T11 T12 T13 T14 T15 T16 T17 T18 T19 T20 T21 T22 T23 T24 T25 T26 T27 T28 T29 T30 T31 T32 T33 T34 T35 T36 T37 T38 T39 T40 T41 T42 T43 T44 T45 T46 T47 T48 T49 T50 T51 T52 T53 T54 T55 T56 T57 T58 T59 T60 T61 T62 T63 T64 T65 T66 T67 T68 T69 T70 T71 T72 T73 T74 T75 T76 T77 T78 T79 T80 T81 T82 T83 T84 T85 T86 T87 T88 T89 T90 T91 T92 T93 T94 T95 T96 T97 T98 T99 T100

REV SMOOTHED PROFILE
1500M ZERO RUN NO
REV SMOOTHED PROFILE
MEASURED AVE, FWD
MEASURED AVE, REV

FWD	REV
WIDEN OFFSET	WIDEN OFFSET
2.25	-1.40
1.00	1.00
WIDEN GRAD CORRECTION	WIDEN GRAD CORRECTION
4.32	-1.30



data for smoothed profile: FWD
data for measured/avg profile: FWD/AVG

1.00 M TOR PRESSURE

WIDEN PRESSURE CORRECTION: 0.00 used

WORST CASE DEVIATIONS OF AVERAGED FROM PROFILE

	SCAN TIME (MSEC)	MEAN ERROR	ONE SIGMA	TWO SIGMA	REMARKS	P/P
FWD	1821.57	1.55	1.23	1.57		
REV	4531.25	1.69	1.34	1.71	51.70	P

0 MICROGRADUANS

Run No. 32015.1554

QA Stamp Date 3/8/80

Test Flow Event L-13 eq 8

Tested By

Comments test on 13.19 5/0/19 REV SCAN 75 to end

ORIGINAL PAGE IS
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TS 32015-004
8 March 1980

DATA SHEET 4.3.6-3
OPERATIONAL PERFORMANCE
ALONG SCAN GEOMETRIC REPEATABILITY

SMA Designation F-1 ACCEPT TEST S/N

SAW MODE (and calibrated) deviation profile

SME (1) or (2) 1

Voltage: High, Nom, Low

IPAR COUNTS:

CALIBRATION

BUMPER A
P3 P3

MID - P1 P4
P0 P0

BUMPER B

SCANNING

STIM OFFSETS, MRAD

MEAN VALUES	P2	P3	P4	P5
	24	12		
	6.2	2.9		
	3.0	3.0		
		3.5		

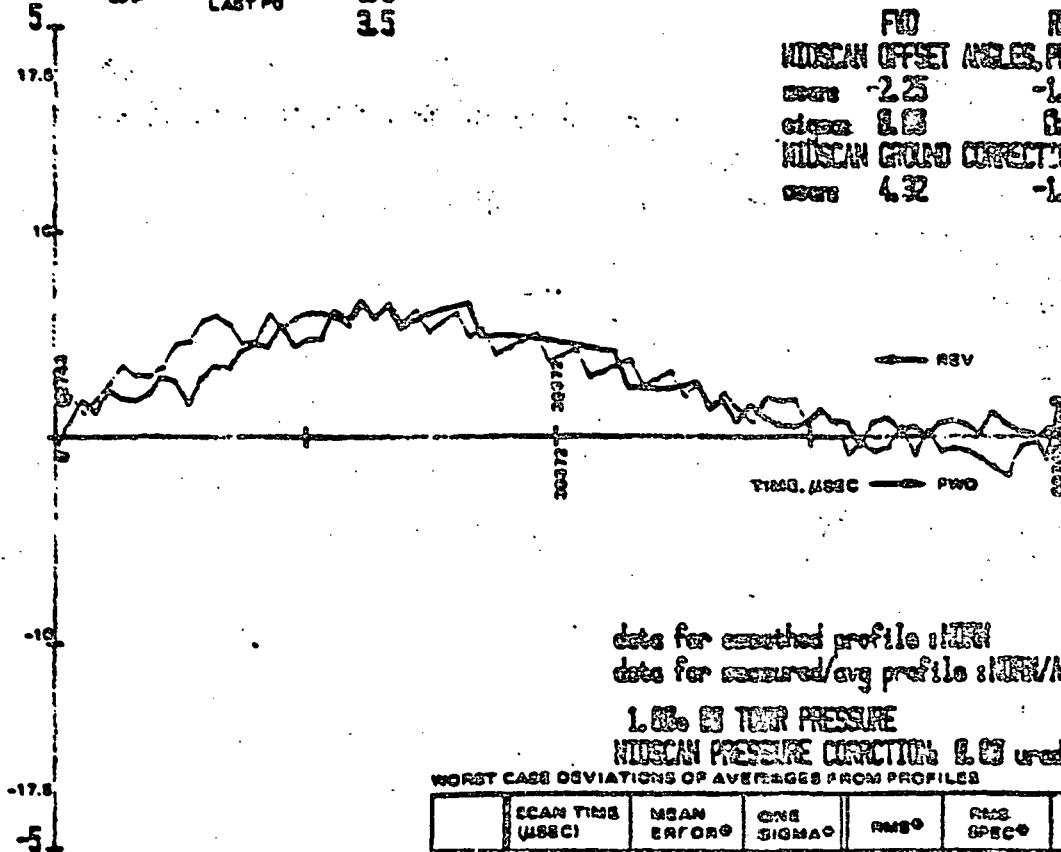
LAST P0

TEMP: T1 T2 T3 T4 T5 T6 T7 T8 T9
22.7 21.6 22.3 22.6 22.9 23.0 21.9 22.4 21.5
GAS ANGLE USED (MRAD) -57.171 67.150

PWD SMOOTHED PROFILES
(FROM TFE-H RUN NO 33581.155)
REV SMOOTHED PROFILE
MEASURED AVG, PWD
MEASURED AVG, REV

	PWD	REV
WIDSCAN OFFSET ANGLES, PWD, REV		
mean	-2.25	-1.43
class	0.03	0.03
WIDSCAN GROUND CORRECTION		
mean	4.32	-1.53

NON LINEARITY, PRAD



data for smoothed profile : PWD
data for measured/avg profile : REV/AVG

1.0% IN TONR PRESSURE
WIDSCAN PRESSURE CORRECTION: 0.03 used

WORST CASE DEVIATIONS OF AVERAGES FROM PROFILES

	SCAN TIME (μSEC)	MEAN ERROR	ONE SIGMA	RMS	RMS SPEC	P/P
PWD	10000.57	1.55	0.23	1.57		
REV	15310.25	1.00	0.34	1.71	01.73	P

• MICRORADIANS

Run No. 33581.1554

QA Stamp

Date

Test Flow Event L-13 seq 6

Tested By

Comments test no 13.19 FWD/REV SCAN 75pts each

ORIGINAL PAGE IS
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DATA SHEET 4.3.5-4
OPERATIONAL PERFORMANCE
CROSS SCAN REPEATABILITY

TS 32015-004
8 March 1980

GMA Designation F-1 ACCEPT TEST S/N 4

SAN MIDE

SME (1) or (2) 1

Voltage: High ___ Norm ___ Low ___

27.5 -27.4 82

FORWARD LINEAR IPAR-ALIGNMENT
TERM REMOVED:

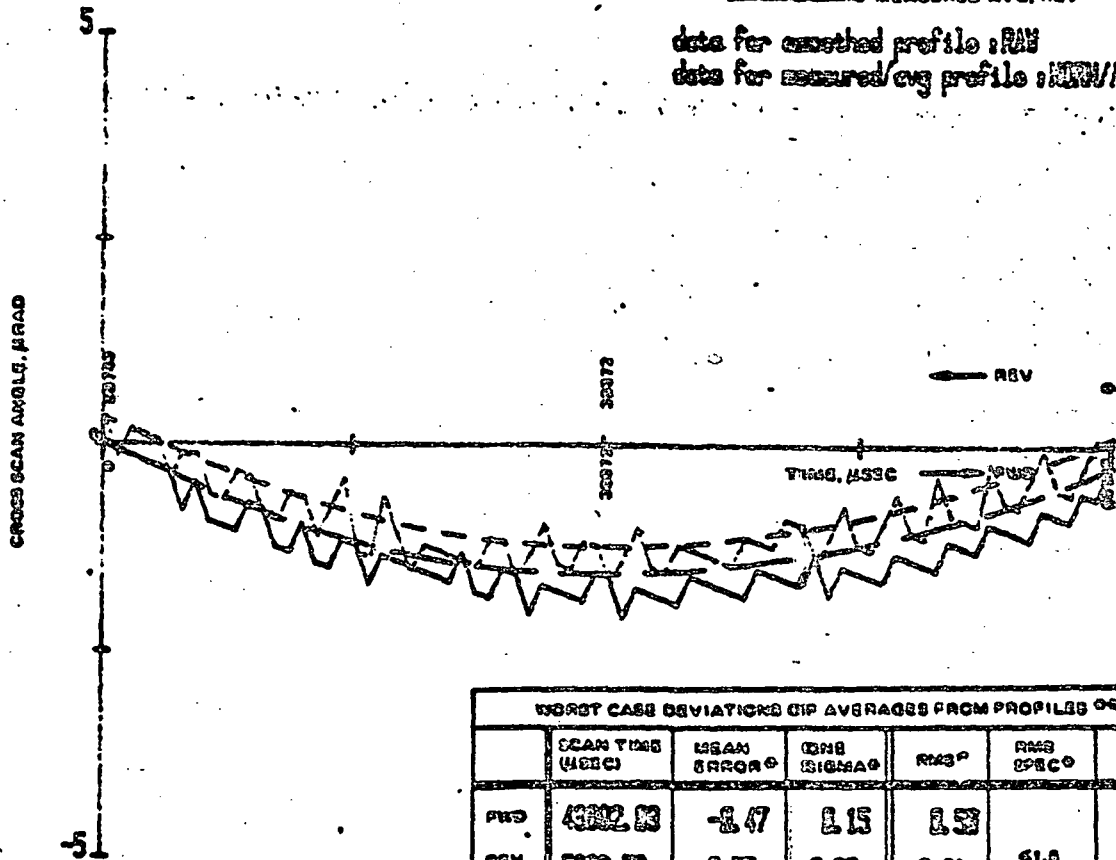
01.03 urod

(FROM TPE-F RUN NO.

— FWD SMOOTHED PROFILE
(FROM TPE-F RUN NO. 1554)
— REV SMOOTHED PROFILE
— MEASURED AVG. FWD
— MEASURED AVG. REV

data for smoothed profile: RAW

data for measured avg profile: MEAS/AVG



WORST CASE DEVIATIONS OF AVERAGES FROM PROFILES						
	SCAN TIME (MSEC)	MEAN ERROR	ONE SIGMA	RMS	RMS SPEC	P/P
FWD	4302.03	-1.47	1.15	1.53		P
REV	5002.78	-1.57	1.23	1.61	41.5	

PRESSURE:

1.00

• MICRORADIANS
• AFTER REMOVING THE LINEAR
IPAR-ALIGNMENT TERM THAT WAS REMOVED
FROM THE ORIGINAL PROFILE

Run No. 3531.1554

Test Flow Event L-13 889 8

Comments test no. 13

QA Stamp Date 3531

Tested By

ACCEPT-AT-FM:trk0,file4,rev002781

ORIGINAL PAGE IS
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=====TEST INITIAL CONDITIONS=====

- 1) Fans must be off for at least 20 min.
- 2) Both Lasers must be on at least 45 min
- 3) STS temp (+Z-X) must be +/-1 deg from (-Z-X)
- 4) Chamber pressure must be less than 2 torr
- 5) Cross axis polarity correct

=====

Temperatures and Voltages

Ch	Scanner Out	Device	Cal	Measurement
4	2.2985E 03	SMA -Z	1	21.590 Deg C
12	9.5813E 03	MF(-Z-X)	3	20.408 Deg C
13	9.5651E 03	MF(+Z-X)	3	20.535 Deg C

Date: 030581 Time: 1554

SMA Designation: F-1 ACCEPT TEST
 Serial Number: 4
 Run Number: 30581.1554
 Test Flow Event: L
 Test Number: 13
 Sequence Number: 6

INITIALIZE Words Transferred: 4

Word Number 0: INTERRUPT (Raw 177771 Octal)

Bit	Description	Setting
0	Panel Mode	1
1	Calibrate Mode	0
2	Scan Mode	0

Word Number 1: PANEL STATUS (Raw 042402 Octal)

Bit	Description	Setting
0	Bumper SW On	0
1	Beep SAM P0/P3	1
2	Beep SAM P2/P5	0
3	Beep SAM PA/PB	0
45	Processed SAM	1
45	Raw SAM	0
45	SAM 1 or SAM 2	0
45	SAM 3 (CAL SAM)	0
6	Single Reset	0
7	End SAM P0/P3	0
8	End SAM P2/P5	1
9	End SAM PA/PE	0
10	Ext Reset	1
11	5 Facet	0
12	Calibrate Mode	0
13	Scan Mode	0
14	Initialize Mode	1
15	Slow Telemetry Mode	0

Word Numbers 2 and 3: (Raw 176747 057730 Octal)

Scan Count Preset:	7730 Octal	No. of Scans:	39
Time Count Preset:	3757165	No. of Samples:	75

Number of Scans of S\$ Dimension: 41
 Scans x Samples: 3075
 Number of Samples plus 1: 76
 Dimension of S\$ Array: 14950
 Dimension of W\$ Array: 82

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Along 164215.59 Cross 113.74 A-Octal-B Minutes: 954.90
Sigma 0.60 0.79

-----BUMPER B-----

Along -3163.25 Cross -3.00 A-Octal-B Minutes: 955.35
Sigma 0.00 0.00

-----P1P2-----

Along 164215.59 Cross 113.74 A-Octal-B Minutes: 956.00
Sigma 0.60 0.79

-----BUMPER A-----

Along 331892.00 Cross 238.00 A-Octal-B Minutes: 956.42
Sigma 3.00 0.00

-----P2P3-----

Along 329371.13 Cross 236.47 A-Octal-B Minutes: 956.60
Sigma 0.33 0.81

-----P0P5-----

Along 0.45 Cross -0.47 A-Octal-B Minutes: 957.22
Sigma 0.50 0.50

Along Scan Calibration
Time at end of Cal: 1557.13

Facet	IFAR Counts	Preset Angles	No. a, b
P0P5	0.45 -0.47	-6.7170900E-02	1.6421578E 05
P1P4	164215.78 113.47	0.0000000E 00	2.4463487E 06
P2P3	329371.71 236.33	6.7159200E-02	1.3679156E 04

K = 0.500090

Bumper A: 331891.47
Bumper B: -3163.25

CROSS SCAN conversion factor: 0.409urad/IFAR count
CROSS AXIS THERM DRIFT RATE: 0.09urad/min
CROSS SCAN linear term desired: 5.97urad

Collection: 21 tape AT-FM, P00, file 5, rev 22581

Time at end of SCAN: 1558.05 958.05
Time between Cal end Scan: 0.92min
CROSS AXIS DRIFT: 1.12° P0 to SCAN: -0.08urad
CROSS AXIS REFERENCE OFFSET: -0.28urad

ORIGINAL PAGE IS
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Chemical Pressure: 1.60

Temperatures and Voltages

Ch	Standard Dev	Device	Cal	Measurement
0	-1.0000E-04	QUARTER	3	ERROR
1	2.2500E-02	EU=6.81	5	2256.980 mAmps
2	1.2500E-03	EU=+271	5	29.980 mAmps
3	-1.2500E-03	EU=-271	5	25.500 mAmps
4	2.2500E-03	SNA -1	1	21.503 Deg C
5	2.2500E-03	SNA -2	1	22.500 Deg C
6	2.2500E-03	SNA +1	1	22.706 Deg C
7	2.2500E-03	SNA +2	1	22.291 Deg C
8	2.2500E-03	TOPQ-800C	1	22.672 Deg C
9	2.2500E-03	SME TEMP	2	26.900 Deg C
10	2.2500E-03	SAN TEMP	1	23.939 Deg C
11	9.2164E-00	EU=6.8V	4	6.216 Volts
12	9.5513E-03	NFC-1-X	3	20.406 Deg C
13	9.5544E-03	NFC+1-X	3	20.541 Deg C
14	4.3350E-00	SME(1)TEL	4	4.335 Volts
15	2.2517E-01	SME(2)TEL	4	0.237 Volts
16	-1.0000E-04	SME PR UP	3	ERROR
17	9.8217E-00	SAN1-BNP2	4	9.823 Volts
18	2.7483E-01	EU=+27V	4	27.483 Volts
19	-2.7088E-01	EU=-27V	4	-27.355 Volts

Data Tape Identifier: F1D7
Track for Data: 1
Init Cal Data File Number: 1
Scan Data File Number: 2
Norm Avg Scan Data File Number: 3

IF 'ERROR' IS OCCURS DURING MARKING OF TAPE:
press RETURN--press execute--press continue

TELEMETRY PRINTOUT, 1:00:01-1:00:01, file 15, rev 22381

Date: 03001: Time: 1554

ORIGINAL PAGE IS
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Designation: F-1 ACCEPT TEST
 Serial Number: 4
 Run Number: 30531.1554
 Test Flow Event: L
 Test Number: 13
 Sequence Number: 6

data tape identifier: F1D7
 tick for data: 1
 INITIAL data file number: 1
 SCAN data file number: 2
 NORM/AVG SCAN data file number: 3
 Sequence Coeffs file number: 0

mode selected: NORM/AVG

TELEMETRY PRINTOUT, 2:00:01-2:00:01, file 16, rev 22381

Date: 03001: Date Time: 1554

SCAN MODE operation

scan N: no. of words transferred = 187

Line Length, N-1: 376 320 024 000
 Active Scan Time, N-1: 60742.81
 Final Time, N: 60743.30

TELEMETRY

Byte No	Name	Contents	Pulses	Time(usec)
1	SYNC	006		
2	OPSTAT N	006	Bit 7 = 0: Scan N= Forward	
3	SCN LIN N	130	88	16.58
4	5 TRNERR N	003 266	950	179.03
6	7 TORPLS N	360 143	-3997	-753.24
8	9 SHSERR N-1	377 355	-19	-3.58
10	11 FHSERR N-1	000 024	20	3.77
13	14 SUMERR N-1	377 360 143	-3997	-753.24
15	16 SCNCTR	000 126		
17	SCN LIN N-1	250	-88	-16.58
18	19 TRNERR N-1	001 115	333	62.75
20	21 TORPLS N-1	360 044	-4060	-765.11
22	23 SHSERR N-2	000 020	16	3.02
24	25 FHSERR N-2	377 356	-18	-3.39
27	28 SUMERR N-2	377 360 046	-4058	-764.73
30	31 SCHTYM N-2	004 353 033	322331	60743.39
32	NSCANS	371	No.Scans =	249 (decimal)

scan N: 2 no. of words transferred = 182

Line Length, N-1: 001 057 356 377
 Active Scan Time, N-1: 60743.00
 Final Time, N: 60743.30

TELEMETRY

Byte No	Name	Contents	Pulses	Time(usec)
1	SYNC	200		
2	OPSTAT N	206	Bit 7 = 1: Scan N= Reverse	
3	SCN LIN N	250	-88	-16.58

10	11	FHSERR	N-1	377	355	-18	-3.39
12	13	SUMERR	N-1	377	360	046	-4058
15	16	SCNCTR		000	127		-764.73
17	18	SCNLIN	N-1	130		88	16.58
18	19	TRNERR	N-1	003	266	950	179.03
20	21	TORPLS	N-1	360	143	-3997	-753.24
22	23	SHSERR	N-2	377	355	-19	-3.58
24	25	FHSERR	N-2	000	024	20	3.77
26	27	SUMERR	N-2	377	360	143	-3997
29	30	SCNTYM	N-2	004	353	030	322328
32		NSCANS		037			60742.82

No.Scans = 31 (decimal)

ORIGINAL PAGE IS
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scan N: 38 no. of words transferred = 182

Line Length,N-1: 001 057 360 377
Active Scan Time,N-1: 60742.62
Final Time,N: 60743.30

TELEMETRY

Byte No	Name	Contents	Pulses	Time(usec)
1	SYNC	200		
2	OPSTAT N	206	Bit 7 = 1: Scan N= Reverse	
3	SCNLIN N	250	-88	-16.58
4	5 TRNERR N	001 116	334	62.94
6	7 TORPLS N	360 050	-4056	-764.35
8	9 SHSERR N-1	000 022	18	3.39
10	11 FHSERR N-1	377 360	-16	-3.02
12	13 14 SUMERR N-1	377 360 047	-4057	-764.54
15	16 SCNCTR	000 151		
17	18 SCNLIN N-1	130	88	16.58
18	19 TRNERR N-1	003 265	949	178.84
20	21 TORPLS N-1	360 143	-3997	-753.24
22	23 SHSERR N-2	377 356	-18	-3.39
24	25 FHSERR N-2	000 024	20	3.77
26	27 28 SUMERR N-2	377 360 142	-3998	-753.42
29	30 31 SCNTYM N-2	004 353 027	322327	60742.64
32	NSCANS	037	No.Scans = 31 (decimal)	

scan N: 39 no. of words transferred = 181

Line Length,N-1: 376 320 023 000
Active Scan Time,N-1: 60743.00
Final Time,N: 60743.48

TELEMETRY

Byte No	Name	Contents	Pulses	Time(usec)
1	SYNC	200		
2	OPSTAT N	006	Bit 7 = 0: Scan N= Forward	
3	SCNLIN N	130	88	16.58
4	5 TRNERR N	003 266	950	179.03
6	7 TORPLS N	360 143	-3997	-753.24
8	9 SHSERR N-1	377 355	-19	-3.58
10	11 FHSERR N-1	000 023	19	3.58
12	13 14 SUMERR N-1	377 360 143	-3997	-753.24
15	16 SCNCTR	000 151		
17	18 SCNLIN N-1	250	-88	-16.58
18	19 TRNERR N-1	001 116	334	62.94
20	21 TORPLS N-1	360 050	-4056	-764.35
22	23 SHSERR N-2	000 022	18	3.39
24	25 FHSERR N-2	377 360	-16	-3.02
26	27 28 SUMERR N-2	377 360 047	-4057	-764.54
29	30 31 SCNTYM N-2	004 353 027	322327	60742.64

ORIGINAL PAGE IS
OF POOR QUALITY

DATA SHEET 4.2.5-1
OPERATIONAL PERFORMANCE
SCAN TO SCAN REPEATABILITY

TS 32015-004
8 March 1990

SMA Designation F-1 ACCEPT TEST

S/N: 4

SW NOTE

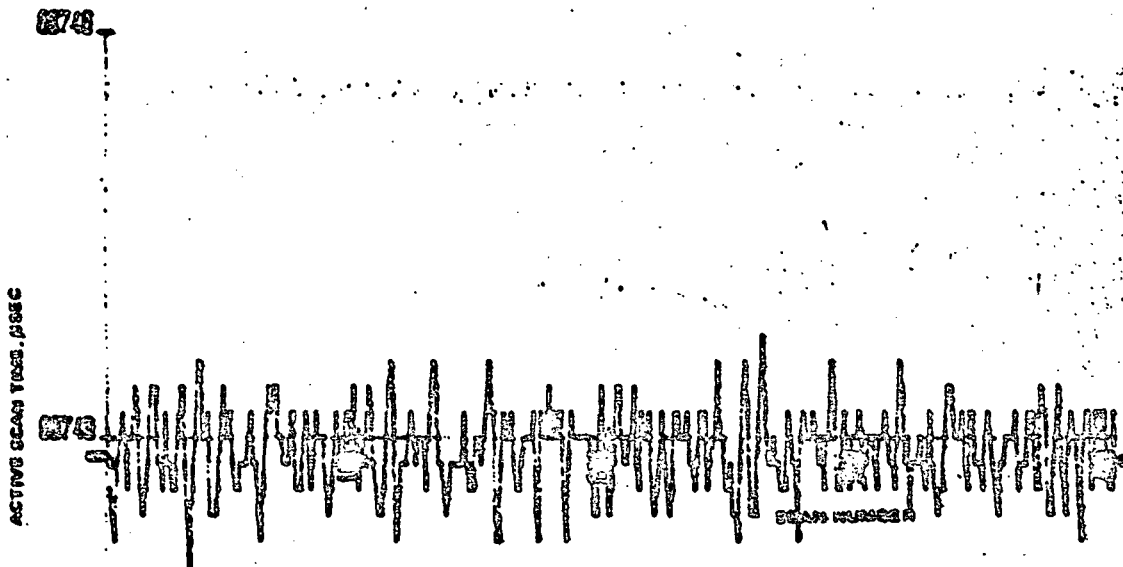
2312 (1) or (2):

Voltage: High —, Nom —, Low —

27.5 -27.4 8.2

400 CONSECUTIVE
(250 PPS, 250 REV)

23 P2
23 P1



	CLOCK-CORRECTED LINE-LENGTH, PSEC					
	MEAN	OPC	P/P	ONE SIGMA	OPC	P/P
P23	27.4	27.4	P	1.3	0.75	P
P23	27.4	27.4	P	1.3	0.75	P

Run No. 3321.155

Test Flow Event L-15 seq 8

Comments test no. 15

QC Stamp

Date

3/8/91

Tested By

ORIGINAL PAGE IS
OF POOR QUALITY

228

DATA SHEET 4.3.6-3
OPERATIONAL PERFORMANCE
ALONG SCAN GEOMETRIC REPEATABILITY

TS 32015-004
8 March 1980

SMA Designation F-1 ACCEPT TEST S/N4

SAN MIRE (and calibrated)
SAS (1) or (2) 2

Voltage: High —, Nom —, Low —

IPAR COUNTS:
CALIBRATION

BUMPER A

MID - P1 P4

BUMPER B

SCANNING

MEAN VALUES
P2
P1
P0

3.0
3.5
2.5

K - 1.50002

SIZE OFFSETS, HRAD

P3
P4
P5
LAST P0

-22
-15
L8
24

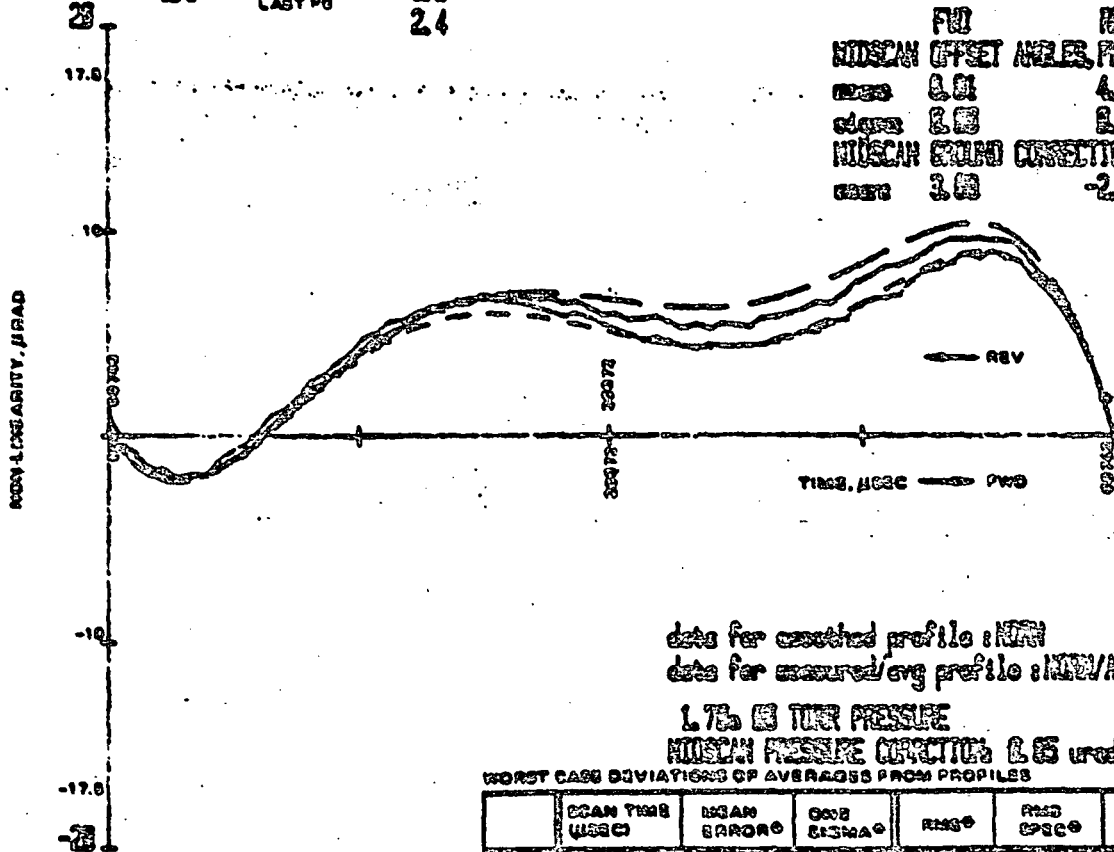
TEMP: T1 T2 T3 T4 T5 T6 T7

27.5 21.6 22.3 22.6 22.0 23.0 21.9 21.4 21.5

SAN ANGLES
USED (INRAD) -07.102 07.102

PWD SMOOTHED PROFILE
PROM-TECH RUN NO. 27.102
REV SMOOTHED PROFILE
MEASURED AVG. PWD
MEASURED AVG. REV

FWD
MIDSCAN OFFSET ANGLES, DEG. REV
P2 0.01 4.34
P1 0.01 0.01
P0 0.01 0.01
MIDSCAN BOUND CORRECTION
P2 1.00 -2.00



data for smoothed profile: MIRE
data for measured/avg profile: MIRE/AVG

1.75 IN TIRE PRESSURE
MIDSCAN PRESSURE CORRECTION 0.05 used

WORST CASE DEVIATIONS OF AVERAGES FROM PROFILES

	SCAN TIME (HRC)	MEAN ERROR	ONE SIGMA	RMS	PWD OPSC	P/P
PWD	4302.00	-1.12	0.30	1.10		
REV	4451.14	0.00	0.25	0.92	41.70	P

Run No. 3001.1000

Test Flow Event L-23 seq 6

Comments test no. 21 19 F10/19 REV SCAN 75 sec each

QA Stamp

Date

0 MICROGRADIANS

Tested By

ORIGINAL PAGE IS
OF POOR QUALITY

TS 32015-004
8 March 1980

DATA SHEET 4.3.6-3
OPERATIONAL PERFORMANCE
ALONG SCAN GEOMETRIC REPEATABILITY

SAA Designation F-1 ACCEPT TEST S/N 4

SAN HIDE (and calculated deviation profile)

IFAR COUNTS:

GENERATION

BUMPER

P2 P3

MID - P1 P4

P5 P6

BUMPER 8

SCANNING

SAN OFFSETS, #RAD

MEAN
VALUES

P2

P1

P3

P4

P5

P6

LAST P0

5

17.0

10

0

-10

-17.0

-5

NON-LINEARITY, #RAD

63743

63771

63771

63771

63771

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63771

63771

TEMP: T1

T2

T3

T4

T5

T6

T7

T8

T9

22.7

21.6

22.3

22.8

22.9

23.0

23.0

23.4

23.5

SAN ANGLES

USED (#RAD)

-67.182

67.183

PWD SMOOTHED PROFILE
(FROM TPE-4 RUN NO. 100)
REV SMOOTHED PROFILE
MEASURED AVG, PWD
MEASURED AVG, REV

FWO REV
MIDSCAN OFFSET ANGLES, #RAD, #IN-
SCAN 0.01 4.31
SCAN 0.03 0.03
MIDSCAN CORRECTION
SCAN 3.03 -2.48

data for smoothed profile: MIDN
data for measured/avg profile: MIDN/AVG

1.76 IS TIER PRESSURE
MIDSCAN PRESSURE CORRECTION: 0.03 used

WORST CASE DEVIATIONS OF AVERAGES FROM PROFILES

	SCAN TIME (SEC)	MEAN ERROR	ONE SIGMA	RMS	RMS CROSS	P/P
PWD	4332.03	-1.12	0.33	1.10		
REV	4451.14	0.03	0.25	0.02	<1.76	P

* MICROBARIANS

Run No. 3591.1500

Test Flow Event L-23 seq 8

Comments test no. 21 18 FWD/REV SCAN Type each

QA Stamp

Date 3591

Tested By

ORIGINAL PAGE IS
OF POOR QUALITY

DATA SHEET 4.3.6-4
OPERATIONAL PERFORMANCE
CROSS SCAN REPEATABILITY

TS 32015-004
8 March 1980

230

SMA Designation F-1 ACCEPT TEST S/N 4

SIN WIDE

SME (1) or (2) 2

Voltage: High __, Nom __, Low __

27.5 -27.4 8.2

FORWARD LINEAR IPAR-ALIGNMENT
TERM REMOVED:

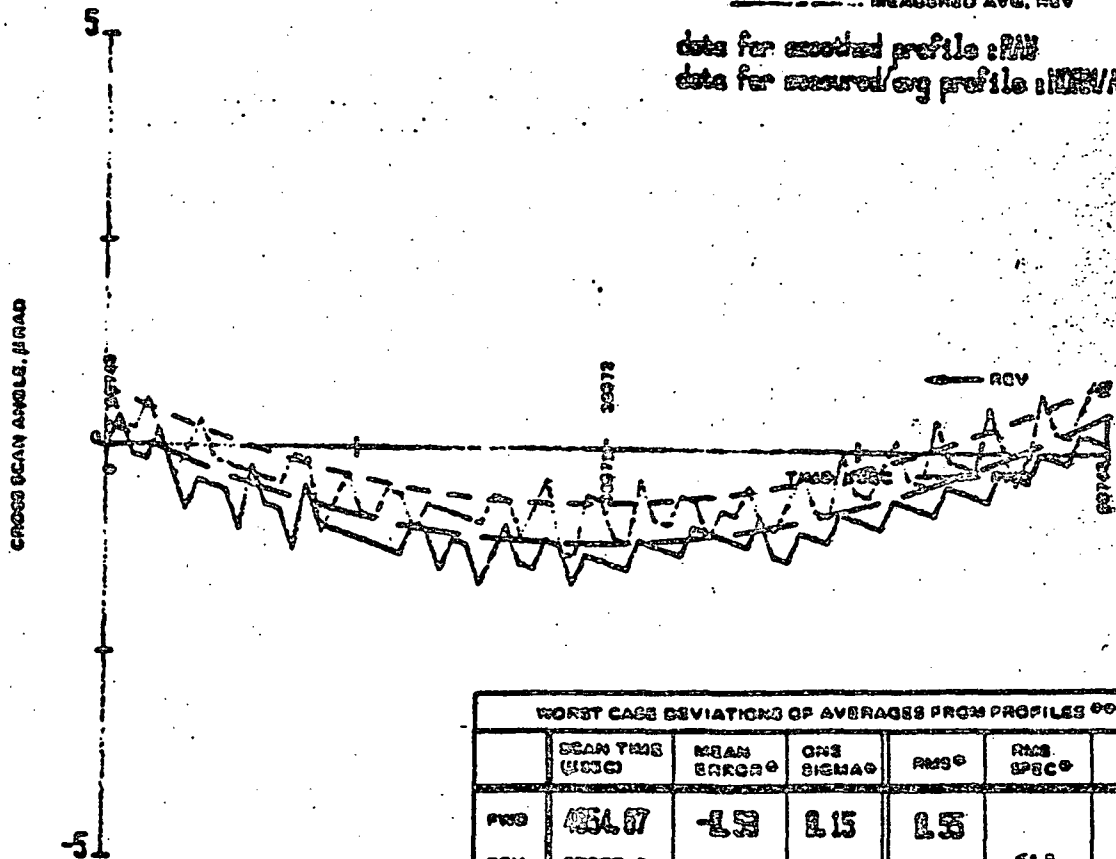
98.53 μ rad

(FROM TFS-P RUN NO.

PRO SMOOTHED PROFILE
(FROM TFS-P RUN NO. 3551.100)
REV SMOOTHED PROFILE
MEASURED AVG. PRO
MEASURED AVG. REV

data for smoothed profile: PRO

data for measured avg profile: MEV AVG



WORST CASE DEVIATIONS OF AVERAGES FROM PROFILES 00						
	SCAN TIME (SEC)	MEAN ERROR	ONE SIGMA	RMS	RMS SPEC	P/P
PRO	454.87	-1.5	1.15	1.5		P
REV	3551.91	-1.6	1.21	1.6	41.9	P

PRESSURE:

1.72 μ

0 MICRORADIANS
00 AFTER REMOVING THE LINEAR
IPAR-ALIGNMENT TERM THAT WAS REMOVED
FROM THE ORIGINAL PROFILE

Run No. 3551.100

Test Flow Event L-23 seq 6

Comments test no. 23

QA Stamp

Tested By

Date 3551

ORIGINAL PAGE IS
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DATA SHEET 4382
OPERATIONAL PERFORMANCE

TS 32015-004

L-16

attach to data sheet 4.3.5-2

400scan parameter; tape AT, rev121386

OPERATIONAL PERFORMANCE
SCAN PARAMETERS

SMA Designation: F-1 ACCEPT TEST

operation: SME(2) SAM

Serial Number: 4

Test Flow Event: L-16 Sea 6

Run Number: 30581.1535

Voltages: 27.5 -27.4 6.2

temperatures	T1	T2	T3	T4	T5	T6	T7	T8	T9
	(+2)	(-2)	(+X)	(-X)	(BRDG)	(SAM)	(SME)	(-2-X)	(+2+X)
deg C	22.8	21.6	22.3	22.7	22.9	23.8	26.7	20.4	20.5

SCAN PARAMETER(400 scans)	MEASURED	REQUIREMENT	SPECIFICATION	P/F
---------------------------	----------	-------------	---------------	-----

clock freq, HZ	10612842	10612875 +-125		P
----------------	----------	----------------	--	---

torque pulse width, usec				P
mean	759	<1100		P
sigma	4			P

turn-around time, usec		10590 +- 68		P
------------------------	--	-------------	--	---

bumper A: mean	10647.1			P
----------------	---------	--	--	---

sigma	0.1			P
-------	-----	--	--	---

bumper B: mean	10534.2			P
----------------	---------	--	--	---

sigma	0.2			P
-------	-----	--	--	---

active scan time, usec				P
------------------------	--	--	--	---

fwd: min	60742.2			P
----------	---------	--	--	---

max	60743.6			P
-----	---------	--	--	---

mean	60742.9			P
------	---------	--	--	---

sigma	0.3			P
-------	-----	--	--	---

rev: min	60742.1			P
----------	---------	--	--	---

max	60743.8			P
-----	---------	--	--	---

mean	60742.9			P
------	---------	--	--	---

sigma	0.3			P
-------	-----	--	--	---

combine: mean	60742.9	60743 +-0.2		P
---------------	---------	-------------	--	---

sigma	0.3	<2.9		P
-------	-----	------	--	---

scan period, usec	142667.2	142666 +-140		P
-------------------	----------	--------------	--	---

scan rate var, percent			+1	P
------------------------	--	--	----	---

fwd: min	-0.001			P
----------	--------	--	--	---

max	0.001			P
-----	-------	--	--	---

rev: min	-0.001			P
----------	--------	--	--	---

max	0.001			P
-----	-------	--	--	---

SAM offset(P0 mean), urad	-6.47			P
---------------------------	-------	--	--	---

line start pulse angular				P
--------------------------	--	--	--	---

jitter(P0 sigma), urad	0.29	<1.00		P
------------------------	------	-------	--	---

SAM angle, urad				P
-----------------	--	--	--	---

fwd: mean	134576			P
-----------	--------	--	--	---

sigma	0.29	<1		P
-------	------	----	--	---

rev: mean	134572			P
-----------	--------	--	--	---

sigma	0.25	<1		P
-------	------	----	--	---

Tested by

QA

NO. REQ'D - 22

3000000 collection: waveRT-FM:trk1,file4,rev121890

Temperatures and Voltages

Ch	Scanner Out	Device	Col	Measurement
4	2.2356E 03	SMA -Z	1	21.623 Deg C
12	9.5301E 03	MF(-Z-X)	3	20.417 Deg C
13	9.5645E 03	MF(+Z-X)	3	20.540 Deg C

Date: 030581 Time: 1535

SMA Designation: F-1 ACCEPT TEST
Serial Number: 4
Run Number: 30581.1535
Test Flow Event: L
Test Number: 16
Sequence Number: 6
Pressure: 1.50E 00 TORR

INITIALIZE Words Transferred: 4

Word Number 0: INTERRUPT (Raw 177771 Octal)

Bit	Description	Setting
0	Panel Mode	1
1	Calibrate Mode	0
2	Scan Mode	0

Word Number 1: PANEL STATUS (Raw 046402 Octal)

Bit	Description	Setting
0	Bumper SW On	0
1	Bea SAM P0/P3	1
2	Bea SAM P2/P5	0
3	Bea SAM PA/PB	0
45	Processed SAM	1
45	Raw SAM	0
45	SAM 1 or SAM 2	0
45	SAM 3 (CAL SAM)	0
6	Single Reset	0
7	End SAM P0/P3	0
8	End SAM P2/P5	1
9	End SAM PD/PE	0
10	Ext Reset	1
11	5 Facet	1
12	Calibrate Mode	0
13	Scan Mode	0
14	Initialize Mode	1
15	Slow Telemetry Mode	0

Word Numbers 2 and 3: (Raw 000000 007157 Octal)

Scan Count Preset:	7157 Octal	No. of Scans:	400
Time Count Preset:	0000000	No. of Samples:	0

Number of Scans of S\$ Dimension: 400
Dimension of S\$ Array: 15226
Dimension of W\$ Array: 800

CALIBRATE: SAM/SME: 2

Facet	IFAR Counts	Preset Angles	No. a:b
P0F5	0.00	-6.7182000E-02	1.6392000E 05
P1P4	163220.00	0.0000000E 00	2.4421305E 06
P2F3	317140.00	6.7159700E-02	-2.4095374E 04

0.500000

ORIGINAL PAGE IS
OF POOR QUALITY

Bumper A: 0.00
Bumper B: 0.00

TEMPERATURES and Voltages

Ch	Scanner Out	Device	Cal	Measurement
0	-1.0000E 04	QUARTER	3	ERROR
1	2.2519E-02	EU=6.81	5	2251.900 mAmps
2	1.4510E-03	EU=+271	5	29.020 mAmps
3	-1.0000E-03	EU=-271	5	25.400 mAmps
4	2.2936E 03	SMA -Z	1	21.646 Deg C
5	2.2046E 03	SMA -X	1	22.666 Deg C
6	2.1930E 03	SMA +Z	1	22.799 Deg C
7	2.2329E 03	SMA +X	1	22.342 Deg C
8	2.1854E 03	TORQ BRDG	1	22.886 Deg C
9	9.3940E 02	SME TEMP	2	26.745 Deg C
10	2.1043E 03	SAM TEMP	1	23.816 Deg C
11	6.2121E 00	EU=6.8V	4	6.212 Volts
12	9.5804E 03	MF(-Z-X)	3	20.414 Deg C
13	9.5646E 03	MF(+Z-X)	3	20.539 Deg C
14	4.4714E-01	SME(1)TEL	4	0.447 Volts
15	4.3461E 00	SME(2)TEL	4	4.346 Volts
16	-1.0000E 04	SME PR U7	3	ERROR
17	1.7928E-01	SAM1/BMP2	4	0.179 Volts
18	2.7483E 01	EU=+27V	4	27.483 Volts
19	-2.7355E 01	EU=-27V	4	-27.355 Volts

=====

ERROR 60 OCCURS DURING MARKING OF TAPE:

Type: to REMARK---press execute---press continue

=====

Data Tape Identifier: F1D7

Back for Data: 0

Init Cal Data File Number: 11

Scan Data File Number: 12

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TS 32015-004
8 March 1980

DATA SHEET 4.3.6-1
OPERATIONAL PERFORMANCE
SCAN TO SCAN REPEATABILITY

SMA Designation F-1 ACCEPT TEST

S/N: 4

BAFPER NIDE

2

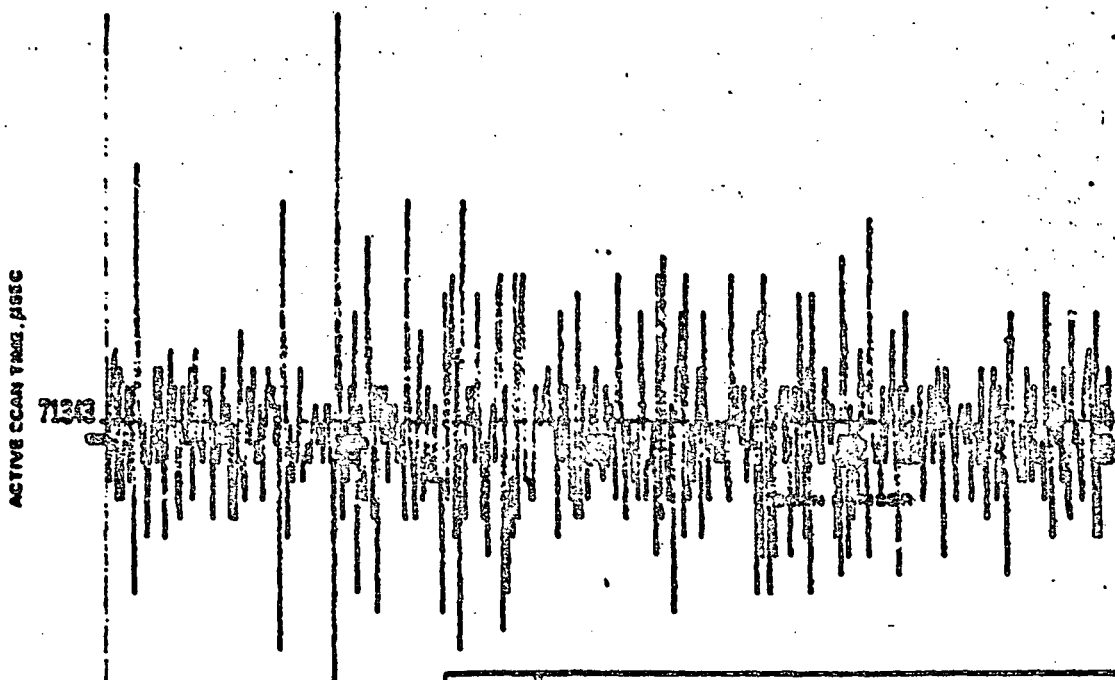
Voltage: High Nom Low

SMR (1) or (2) :

27.5 -27.4 8.2

400 CONSECUTIVE
(200 PWD, 200 REV)

200 PWD
200 REV



	CLOCK-CORRECTED LINE-LENGTH, μSEC					
	MEAN	SPEC	P/P	ONE-SIGMA	CPKC	P/P
PWD	71342.07	71343 ±0.1	P	8.78	0.70 2.0	P
REV	71342.03	71343 ±0.1	P	8.63	0.70 2.0	P

Run No. 3591.1544

Test Flow Event L-18 seq 8

Comments test no. 18

QC Stamp

Date 3/5/81

Tested By

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DATA SHEET 4.3.5-2
OPERATIONAL PERFORMANCE
SCAN PARAMETERS

TS 32015-004

Rev 3

attach to data sheet 4.3.5-2 400scan parameter, tapeH, rev121080

OPERATIONAL PERFORMANCE
SCAN PARAMETERS

SMA Designation: F-1 ACCEPT TEST
Serial Number: 4
Run Number: 30581.1544
temperatures T1 T2 T3 T4 T5 T6 T7 T8 T9
(+2) 22.7 21.6 22.3 22.6 22.9 23.8 26.7 20.4 20.5
(-2) (-X) (SME) (-2-X) (+2+X)
operation: SME(2) BUMPER
Test Flow Event: L-18 Seq 6
Voltages: 27.5 -27.4 6.2

SCAN PARAMETER(400 scans) MEASURED REQUIREMENT SPECIFICATION P/F

clock freq, HZ 10612841 10612875 +-125 P

torque pulse width, usec 842
mean 69
sigma

bumper to bumper time, usec
fwd: min 71340.9
max 71347.1
mean 71342.9
sigma 0.9
rev: min 71349.3
max 71344.7
mean 71342.9
sigma 0.7
combined: mean 71342.9
sigma 0.8



scan period, usec 142685.8 142686 +-1.6
71343 +-0.8
<2.9
P
P
P

scan rate var, percent
fwd: min -0.003
max 0.005
rev: min -0.004
max 0.002

Tested by

NO. REQ'D = 22

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4000 - collection: 17: LecRT-FH: tra1: file4: rev121830

Temperatures and Voltages

Ch	Scanner Out	Device	Col	Measurement
4	1.3210E 03	SMA -2	1	21.507 Deg C
11	2.5338E 03	MF(-Z-Y)	2	20.411 Deg C
13	9.5649E 03	MF(+Z+Y)	3	20.536 Deg C

Date: 030581 Time: 1544

SMA Designation: F-1 ACCEFT TEST
 Serial Number: 4
 Run Number: 30581.1544
 Test Flow Event: L
 Test Number: 18
 Sequence Number: 6
 Pressure: 1.55E 00 TORR

INITIALIZE Words Transferred: 4

Word Number 0: INTERRUPT (Raw 177771 Octal)

Bit	Description	Setting
0	Panel Mode	1
1	Calibrate Mode	0
2	Scan Mode	0

Word Number 1: PANEL STATUS (Raw 042402 Octal)

Bit	Description	Setting
0	Bumper SW On	0
1	Bee SAM P0/P3	1
2	Bee SAM P2/P5	0
3	Bee SAM PA/PB	0
45	Processed SAM	1
45	Raw SAM	0
45	SAM 1 or SAM 2	0
45	SAM 3 (CAL SAM)	0
6	Single Reset	0
7	End SAM P0/P3	0
8	End SAM P2/P5	1
9	End SAM PD/PE	0
10	Ext Reset	1
11	5 Facet	0
12	Calibrate Mode	0
13	Scan Mode	0
14	Initialize Mode	1
15	Slow Telemetry Mode	0

Word Numbers 2 and 3: (Raw 000000 007157 Octal)

Scan Count Preset:	7157 Octal	No. of Scans:	400
Time Count Preset:	0000000	No. of Samples:	0

Number of Scans of S\$ Dimension: 400
 Dimension of S\$ Array: 15226
 Dimension of W\$ Array: 800

CALIBRATE: SAM/SME: 2

Facet	IFAR Counts	Preset Angles	No. a, b
P0P5	0.00	-6.7182000E-02	1.6392000E 05
P1P4	163920.00	0.0000000E 00	2.4421805E 06
P2P3	327840.00	6.7153700E-02	-2.4095374E 04

L = 6.560000

ORIGINAL PAGE IS
OF POOR QUALITY

Bumper B: 0.00

Temperatures and Voltages:

Ch	Scanner Out	Device	Col	Measurement
0	-1.0000E 04	QUARTER	3	ERROR
1	2.2547E-02	EU=6.8I	5	2254.700 mAmps
2	1.4860E-03	EU=+27T	5	29.720 mAmps
3	-1.3100E-03	EU=-27I	5	26.200 mAmps
4	2.2953E 03	SMA -Z	1	21.627 Deg C
5	2.2010E 03	SMA -X	1	22.633 Deg C
6	2.1364E 03	SMA +Z	1	22.737 Deg C
7	2.2360E 03	SMA +X	1	22.306 Deg C
8	2.1861E 03	TORQ BRDG	1	22.878 Deg C
9	9.3992E 02	SME TEMP	2	26.731 Deg C
10	2.1099E 03	SAM TEMP	1	23.752 Deg C
11	6.2115E 00	EU=6.8V	4	6.211 Volts
12	9.5810E 03	MF(-Z-X)	3	20.410 Deg C
13	9.5630E 03	MF(+Z+X)	3	20.536 Deg C
14	2.5343E-01	SME(1)TEL	4	0.253 Volts
15	4.3462E 00	SME(2)TEL	4	4.346 Volts
16	-1.0000E 04	SME PR U7	3	ERROR
17	3.8244E 00	SAM1/BMP2	4	3.824 Volts
18	2.7483E 01	EU=+27V	4	27.483 Volts
19	-2.7356E 01	EU=-27V	4	-27.356 Volts

IF 'ERROR 60' OCCURS DURING MARKING OF TAPE:

type:ato REMARK---press execute---press continue.

Tape Identifier:

F1D7

Back for Data:

0

Init/Cal Data File Number:

13

Scan Data File Number:

14

data collection: tape AT-FN: trk 0: file 4: rev 0321: 81

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=====TEST INITIAL CONDITIONS=====

- (1) Fans must be off for at least 20 min.
- (2) Both Lasers must be on at least 45 min
- (3) DTS temp (+Z+X) must be +/- 1 deg from (-Z-X)
- (4) Chamber pressure must be less than 2 torr
- (5) Cross axis polarity correct

=====

Temperatures and Voltages

Ch	Scanner Out	Device	Cal	Measurement
4	2.7355E 01	SMA -Z	1	ERROR
12	9.5817E 03	MF(-Z-X)	3	20.404 Deg C
13	9.5646E 03	MF(+Z+X)	3	20.539 Deg C

Date: 030581 Time: 1608

SMA Designation: F-1 ACCEPT TEST
 Serial Number: 4
 Run Number: 30581.1608
 Test Flow Event: 1
 Test Number: 20
 Sequence Number: 6

INITIALIZE Words Transferred: 4

Word Number 0: INTERRUPT (Raw 177771 Octal)

Bit	Description	Setting
0	Panel Mode	1
1	Calibrate Mode	0
2	Scan Mode	0

Word Number 1: PANEL STATUS (Raw 042402 Octal)

Bit	Description	Setting
0	Bumper SW On	0
1	Beq SAM P0/P3	1
2	Beq SAM P2/P5	0
3	Beq SAM PA/PB	0
45	Processed SAM	1
45	Raw SAM	0
45	SAM 1 or SAM 2	0
45	SAM 3 (CAL SAM)	0
6	Single Reset	0
7	End SAM P0/P3	0
8	End SAM P2/P5	1
9	End SAM PD/PE	0
10	Ext Reset	1
11	5 Facet	0
12	Calibrate Mode	0
13	Scan Mode	0
14	Initialize Mode	1
15	Slow Telemetry Mode	0

Word Numbers 2 and 3: (Raw 176747 057730 Octal)

Scan Count Preset:	7730 Octal	No. of Scans:	39
Time Count Preset:	3757165	No. of Samples:	75

Number of Scans of S# Dimension: 41
 Scans x Samples: 3075
 Number of Samples plus 1: 76
 Dimension of S# Array: 14950

ORIGINAL PAGE IS
OF POOR QUALITY

Along Cross A-Octal-B
Avg 0.75 0.98 Minutes: 969.37
Sigma 0.79 0.70

-----BUMPER B-----

Along Cross A-Octal-B
Avg -3152.00 -1.00 Minutes: 969.82
Sigma 0.00 0.00

-----PIP2-----

Along Cross A-Octal-B
Avg 164232.00 115.64 Minutes: 976.03
Sigma 0.00 0.87

-----BUMPER A-----

Along Cross A-Octal-B
Avg 331901.20 240.00 Minutes: 970.48
Sigma 0.41 0.00

-----P2P3-----

Along Cross A-Octal-B
Avg 328409.01 237.57 Minutes: 970.72
Sigma 0.39 0.50

-----PQP5-----

Along Cross A-Octal-B
Avg 0.16 1.31 Minutes: 971.27
Sigma 0.37 0.46

Along Scan Calibration
Time at end of Cal: 1611.16

Facet	IFAR Counts	Preset Angles	No. a, b
PQP5	0.16 1.31	-6.7182000E-02	1.6423159E 05
P1P4	164231.59 115.85	0.0000000E 00	2.4464179E 06
P2P3	328409.01 237.67	6.7159700E-02	-1.8667451E 02

K = 0.500082

Bumper A: 331900.94
Bumper B: -3152.48

CROSS SCAN conversion factor: 0.409urad/IFAR count
CROSS AXIS THERM DRIFT RATE: 0.07urad/min
CROSS SCAN linear term desired: 96.69urad

Data collection: 2:tapeAT-FM:trk0:file5:rev23681

Time at end of SCAN: 1612.02 972.03
Time between Cal and Scan: 0.86min
CROSS AXIS DRIFT: (last P0 to SCAN): 0.06urad
CROSS AXIS REFERENCE OFFSET: 0.60urad

Time at end of SCAN: 1612.17 972.20

ORIGINAL PAGE 18
OF POOR QUALITY

Time taken for scan: 0.000000
CROSS HATCH REFERENCE OFFSET: 0.000000

Chamber Pressure (torr): 4.70

Temperatures and Voltages

Ch	Scanner Out	Device	Cal	Measurement
0	-1.0000E 04	QUARTER	3	ERROR
1	2.3005E-02	EU=5.81	5	2303.600 mAmps
2	1.4000E-03	EU=+27I	5	29.000 mAmps
3	-1.2730E-03	EU=-27I	5	25.460 mAmps
4	2.2988E 03	SMA -Z	1	21.587 Deg C
5	2.2098E 03	SMA -X	1	22.607 Deg C
6	2.2004E 03	SMA +Z	1	22.714 Deg C
7	2.2387E 03	SMA +X	1	22.276 Deg C
8	2.1858E 03	TORQ BRDG	1	22.982 Deg C
9	9.3754E 02	SME TEMP	2	26.000 Deg C
10	2.1004E 03	SAM TEMP	1	23.769 Deg C
11	6.2132E 00	EU=6.8V	4	6.213 Volts
12	9.5819E 03	MF(-Z-X)	3	20.403 Deg C
13	9.5654E 03	MF(+Z+X)	3	20.533 Deg C
14	4.4760E-01	SME(1)TEL	4	0.448 Volts
15	4.3461E 00	SME(2)TEL	4	4.346 Volts
16	-1.0000E 04	SME PR U7	3	ERROR
17	1.7949E-01	SAM1/BMP2	4	0.179 Volts
18	2.7483E 01	EU=+27V	4	27.483 Volts
19	-2.7355E 01	EU=-27V	4	-27.355 Volts

Data Tape Identifier: F1D7
Track for Data: 1
Init/Cal Data File Number: 4
Scan Data File Number: 5
Norm/Avg Scan Data File Number: 6

=====

IF 'ERROR' 48 OCCURS DURNING MARKING OF TAPE:

: Press DEL/CLR--press escape--press continue

=====

TELEMETRY PRINTOUT, 1: tape AT-F, trk 0, file 15, rev 22381

Data Date: 030581 Time: 1608

SAM Description: F-1 ACCEPT TEST

Serial Number: 4

Run Number: 30581.1608

Test Flow Event: L

Test Number: 20

Sequence Number: 6

ORIGINAL PAGE IS
OF POOR QUALITY

data tape identifier: F1D7

Index for data: 1

INIT/CHL data file number: 4

SCAN data file number: 5

NORM/AVG SCAN data file number: 6

Scrubbing Coeffs file number: 0

mode selected: NORM/AVG

TELEMETRY PRINTOUT, 2: tape AT-F, trk 0, file 16, rev 22381

Data Date: 030581 Data Time: 1608

SAM MODE Description

Scan N: 1 no. of words transferred = 187

Line Length, N-1: 376 360 022 000

Active Scan Time, N-1: 60742.81

Final Time, N: 60742.73

TELEMETRY

Byte No	Name	Contents	Pulses	Time(used)
1	SYNC	246		
2	OPSTAT N	105		
3	SCNLIN N	130	88	16.58
4	5 TRNERR N	003 325	981	184.87
5	6 7 TORPLS N	360 144	-3996	-753.05
6	8 9 SHSERR N-1	377 357	-17	-3.20
10	11 FHSERR N-1	000 022	18	3.39
12	13 14 SUMERR N-1	377 360 144	-3996	-753.05
15	16 SCNCTR	000 361		
17	17 SCNLIN N-1	250	-88	-16.58
18	19 TRNERR N-1	001 177	383	72.18
20	21 TORPLS N-1	360 062	-4046	-762.47
22	23 SHSERR N-2	000 010	8	1.51
24	25 FHSERR N-2	377 367	-9	-1.70
26	27 28 SUMERR N-2	377 360 064	-4044	-762.09
29	30 31 SCNTYM N-2	004 353 032	322330	60743.20
32	NSCANS	304	No.Scans = 196 (decimal)	

scan N: 2 no. of words transferred = 182

Line Length, N-1: 000 277 370 377

Active Scan Time, N-1: 60742.43

Final Time, N: 60742.73

TELEMETRY

Byte No	Name	Contents	Pulses	Time(used)
1	SYNC	246		
2	OPSTAT N	305		
3	SCNLIN N	250	-88	-16.58
4	5 TRNERR N	001 177	383	72.18

Bit 7 = 1: Scan N = Reverse

12	13	14	SUMERR	N-1	377	360	064	-4044	-762.09
15	16	SONCTR			000	362			
17	SONLIN	N-1	130				88	16.58	
18	19	TRNERR	N-1	003	325		981	184.87	
20	21	TORPLS	N-1	360	144		-3996	-753.05	
22	23	SHSERR	N-2	377	357		-17	-3.20	
24	25	FHSERR	N-2	000	022		18	3.39	
26	27	28	SUMERR	N-2	377	360	144	-3996	-753.05
29	30	31	SONTYM	N-2	004	353	030	322328	60742.82
32	NSCANS		037					No.Scans =	31 (decimal)

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scan N: 38 no. of words transferred = 182

Line Length: N-1: 000 237 367 377
Active Scan Time: N-1: 60743.00
Final Time: N: 60743.48

TELEMETRY

Byte No	Name	Contents	Pulses	Time(usec)
1	SYNC	246		
2	OPSTAT N	306	Bit 7 = 1: Scan N= Reverse	
3	SONLIN N	250	-88	-16.58
4	5	TRNERR N	001 177	383 72.18
6	7	TORPLS N	360 064	-4044 -762.09
8	9	SHSERR N-1	000 011	9 1.70
10	11	FHSERR N-1	377 367	-9 -1.70
12	13	14	SUMERR N-1	377 360 064 -4044 -762.09
15	16	SONCTR	001 004	
17	SONLIN N-1	130	88	16.58
18	19	TRNERR N-1	003 324	980 184.68
20	21	TORPLS N-1	360 146	-3994 -752.67
22	23	SHSERR N-2	377 360	-16 -3.02
24	25	FHSERR N-2	000 023	19 3.58
26	27	28	SUMERR N-2	377 360 145 -3995 -752.86
29	30	31	SONTYM N-2	004 353 026 322326 60742.45
32	NSCANS	037		No.Scans = 31 (decimal)

scan N: 39 no. of words transferred = 181

Line Length: N-1: 376 320 022 000
Active Scan Time: N-1: 60743.19
Final Time: N: 60743.48

TELEMETRY

Byte No	Name	Contents	Pulses	Time(usec)
1	SYNC	246		
2	OPSTAT N	106	Bit 7 = 0: Scan N= Forward	
3	SONLIN N	130	88	16.58
4	5	TRNERR N	003 326	982 185.06
6	7	TORPLS N	360 143	-3997 -753.24
8	9	SHSERR N-1	377 355	-19 -3.58
10	11	FHSERR N-1	000 022	18 3.39
12	13	14	SUMERR N-1	377 360 145 -3995 -752.86
15	16	SONCTR	001 004	
17	SONLIN N-1	250	-88	-16.58
18	19	TRNERR N-1	001 177	383 72.18
20	21	TORPLS N-1	360 064	-4044 -762.09
22	23	SHSERR N-2	000 011	9 1.70
24	25	FHSERR N-2	377 367	-9 -1.70
26	27	28	SUMERR N-2	377 360 064 -4044 -762.09
29	30	31	SONTYM N-2	004 353 031 322329 60743.01
32	NSCANS	037		No.Scans = 31 (decimal)

ORIGINAL PAGE IS
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Appendix B

Scan Mirror Assembly Acceptance Test Data

Part 16

Test Flow Event B

ORIGINAL PAGE IS
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DATA SHEET 4.3.7-1
OPERABILITY CHECKS
AUTOMATIC TESTS

TS 32015-004

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ATTACH TO DATA SHEET 4.3.7-1 OPERABILITY CHECKS - AUTOMATIC CHECKS

attach to data sheet 4.3.7-1 operability check, 2; tape AT-FM, trk 0, file 2, rev 121880

OPERABILITY CHECK AUTOMATIC CHECK

SMA Designation: F-1 ACCEPT TEST
Serial Number: 4
Run Number: 30681.1423
Operation: SME(1) SAM
Test Flow Event: N-1
Sequence Number: 6

TEMPERATURES	T1	T2	T3	T4	T5	T6	T7	T8	T9
	(+Z)	(-Z)	(+X)	(-X)	(BRDG)	(SAM)	(SME)	(-Z-X)	(+Z+X)
deg C	29.7	28.4	28.7	29.3	29.0	29.9	34.3	28.1	27.9

SMA POWER SUPPLIES	measured HIGH	supply rms volts	measured mamps	spec mamps	P/F
+27	30.7	28 to 30	31.0	200	P
-27	-30.6	-28 to -30	23.7	200	P
-6.8	8.0	6.3 to 7.7	2243.6	2500	P

BILFVEL DIGITAL TELEMETRY, volts
SME(1) ON 4.3
SME(2) ON 0.2
SAM(1)/BUMPER(2) 3.9

MODE
SME(1), SAM

PRESSURE, torr
1.3 req'd <= 2

TORQUE PULSES, usec (100 scans)
TAU A 797.6
TAU B 753.3
mean 797.6
sigma 0.2
req'd 600 to 1000

ACTIVE SCAN TIME, usec (100 scans)
combined mean 60742.9
sigma 60742.8
req'd 600 to 1000
sigma 0.3
req'd 2.9

TURN-ON TIME, sec
(time to reach within 10 usec of active scan time)
8.9 spec <= 60

Tested by

QA SCOP

TS 32015-004

ORIGINAL PAGE IS
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Run Date: 000001
Run Number: 30081.1423
Test Flow Event: N
Sequence Number: 6

SAM MODE operation

scan N: 99 - no. of words transferred = 32

Line Length, N-1: 377 020 020 000
Active Scan Time, N-1: 60742.81
Final Time, N: 60743.11

TELEMETRY

Byte No	Name	Contents	Pulses	Time(μsec)
1	SYNC	200		
2	OPSTAT N	006	Bit 7 = 0: Scan N= Forward	
3	SONLIN N	130	88	16.58
4	5 TRNERR N	003 277	959	180.72
6	7 TORPLS N	360 143	-3997	-753.24
8	9 SHSERR N-1	377 361	-15	-2.83
10	11 FHSERR N-1	000 020	16	3.02
12	13 14 SUMERR N-1	377 360 143	-3997	-753.24
15	16 SCNCTR	004 041		
17	SONLIN N-1	250	-88	-16.58
18	19 TRNERR N-1	001 124	340	64.07
20	21 TORPLS N-1	357 171	-4231	-797.33
22	23 SHSERR N-2	000 035	29	5.47
24	25 FHSERR N-2	377 345	-27	-5.09
26	27 28 SUMERR N-2	377 357 170	-4232	-797.52
29	30 31 SCNTYM N-2	004 353 027	322327	60742.64
32	NSCANS	037	No.Scans =	31 (decimal)

scan N: 100 - no. of words transferred = 31

Line Length, N-1: 001 337 344 377
Active Scan Time, N-1: 60742.81
Final Time, N: 60743.48

TELEMETRY

Byte No	Name	Contents	Pulses	Time(μsec)
1	SYNC	200		
2	OPSTAT N	206	Bit 7 = 1: Scan N= Reverse	
3	SONLIN N	250	-88	-16.58
4	5 TRNERR N	001 123	339	63.88
6	7 TORPLS N	357 170	-4232	-797.52
8	9 SHSERR N-1	000 035	29	5.47
10	11 FHSERR N-1	377 344	-28	-5.28
12	13 14 SUMERR N-1	377 357 170	-4232	-797.52
15	16 SCNCTR	004 041		
17	SONLIN N-1	130	88	16.58
18	19 TRNERR N-1	003 277	959	180.72
20	21 TORPLS N-1	360 143	-3997	-753.24
22	23 SHSERR N-2	377 361	-15	-2.83
24	25 FHSERR N-2	000 020	16	3.02
26	27 28 SUMERR N-2	377 360 143	-3997	-753.24
29	30 31 SCNTYM N-2	004 353 030	322328	60743.82
32	NSCANS	037	No.Scans =	31 (decimal)

ORIGINAL PAGE IS
OF POOR QUALITY

TS 32015-0046
Rev. B

DATA SHEET 4.3.7-2: OPERABILITY CHECKS

Manual Tests

SMA Designation F-1 S/N 4 SWE(1) ON ☒ SWE(2) OFF

Step

(a)

MUX Pulse Interfaces

Place check in blocks indicated after observing the waveform (see Figure 4.3-12). The signal low should be 40 ± 40 m volts, and the signal high should be 100 ± 40 mV. The pulse duration should be from 300 μ sec to 400 μ sec. (For Pseudo SAMS just confirm their presence with a check)

SIGNAL	SWITCH POSITION	MON	SWITCH POSITION	COMPLEMENT	PSEUDO (40 μ sec)
Pulses	3 or 7	<input checked="" type="checkbox"/>	4 or 8	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Direction	1 or 5	<input checked="" type="checkbox"/>	2 or 6	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

(b)

"SWE 1 ON MUX":

Logic 1

Logic 0

If SWE (1) is ON ☒

4.5 to 5.5 volts ☒

If SWE (2) is ON ☒

0 to 0.8 volt Pass Fail

Date 3/8/81 QA Stamp

Test Flow Event N

Tested by [Signature]

Comments

No. Req'd = 20

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DATA SHEET 4.3.7-1
OPERABILITY CHECKS
AUTOMATIC TESTS

TS 32015-004

246

ATTACH TO DATA SHEET 4.3.7-1 OPERABILITY CHECKS
076...

attach to data sheet 4.3.7-1 operability check, 2: tape AT-FM, trk 0, file 2, rev 121880

OPERABILITY CHECK
AUTOMATIC CHECK

SMA Designation: F-1 ACCEPT TEST
Serial Number: 4
Run Number: 30681.1439
Operation: SME(1) BUMPER
Test Flow Event: N-3
Sequence Number: 6

TEMPERATURES
deg C
T1 (+2) 29.7
T2 (-2) 28.4
T3 (+X) 28.7
T4 (-X) 29.3
T5 (BRDG) 29.0
T6 (SME) 30.0
T7 34.3
T8 (-2-X) 28.1
T9 (+2+X) 27.9

SMA POWER SUPPLIES
measured HIGH
+27 30.7
-27 -30.6
-6.8 8.0
supply rms volts
28 to 30
-28 to -30
6.3 to 7.7
measured mamps
28.5
27.2
2242.3
spec mamps
200
200
2500
P/F
P
P
P

BILEVEL DIGITAL
TELEMETRY, volts
SME(1) ON 4.3
SME(2) ON 0.4
SME(1)/BUMPER(2) 0.2

MODE : SME(1), BUMPER

PRESSURE, torr 0.6 req'd <= 2

TORQUE PULSES, usec
(100 scans) TRAU A 851.1
TRAU B 865.6
sigma 0.7
req'd ---

BUMPER-BUMPER TIME, usec combined
(100 scans) mean 71342.9
sigma 71342.2
req'd sigma 0.6
2.9 P P

TURN-ON TIME, sec
(time to reach within 10 usec of active scan time)
7.9 spec <= 60

Tested By

QA Stamp

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Date: 030881 Date Time: 1439

Destination: F-1 ACCEPT TEST
Serial Number: 4
Run Number: 30681.1439
Test Flow Event: N
Sequence Number: 6

BUMPER MODE operation

Scan N: 99 no. of words transferred = 32

Line Length, N-1: 005 306 321 000
Bumper to Bumper Time, N-1: 71343.0
Final Time, N: 60743.11

TELEMETRY

Byte No	Name	Contents	Pulses	Time(usec)
1	SYNC	200		
2	OPSTAT N	046	Bit 7 = 0: Scan N= Forward	
3	SCN LIN N	130	88	16.58
4	TRNERR N	000 000	0	0.00
6	TORPLS N	356 017	-4593	-865.55
8	SHSERR N-1	000 000	0	0.00
10	FHSERR N-1	000 000	0	0.00
13	SUMERR N-1	377 356 017	-4593	-865.55
15	SCNCTR	004 112		
17	SCN LIN N-1	250	-88	-16.58
18	TRNERR N-1	000 000	0	0.00
20	TORPLS N-1	356 132	-4518	-851.42
22	SHSERR N-2	000 000	0	0.00
24	FHSERR N-2	000 000	0	0.00
27	SUMERR N-2	377 356 132	-4518	-851.42
29	SCNTYM N-2	004 353 030	322328	60742.82
32	NSCANS	037	No.Scans =	31 (decimal)

Scan N: 100 no. of words transferred = 31

Line Length, N-1: 005 306 320 377
Bumper to Bumper Time, N-1: 71342.8
Final Time, N: 60743.11

TELEMETRY

Byte No	Name	Contents	Pulses	Time(usec)
1	SYNC	200		
2	OPSTAT N	246	Bit 7 = 1: Scan N= Reverse	
3	SCN LIN N	250	-88	-16.58
4	TRNERR N	000 000	0	0.00
6	TORPLS N	356 132	-4518	-851.42
8	SHSERR N-1	000 000	0	0.00
10	FHSERR N-1	000 000	0	0.00
13	SUMERR N-1	377 356 132	-4518	-851.42
15	SCNCTR	004 112		
17	SCN LIN N-1	130	88	16.58
18	TRNERR N-1	000 000	0	0.00
20	TORPLS N-1	356 017	-4593	-865.55
22	SHSERR N-2	000 000	0	0.00
24	FHSERR N-2	000 000	0	0.00
27	SUMERR N-2	377 356 017	-4593	-865.55
29	SCNTYM N-2	004 353 031	322329	60743.01

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TS 32015-0045
Rev. B

DATA SHEET 4.3.7-2: OPERABILITY CHECKS

Manual Tests

SMA Designation F-1 S/N 4 SHE(1) ✓ SHE(2) ✓

Step

Bmpt

(a)

MUX Pulse Interfaces

Place check in blocks indicated after observing the waveform (see Figure 4.3-12). The signal low should be 40 ± 40 m volts, and the signal high should be 600 ± 40 mv. The pulse duration should be from 300 μ sec to 400 μ sec. (For Pseudo SAMS just confirm their presence with a check)

SIGNAL	SWITCH POSITION	WAVE	SWITCH POSITION	COMPLEMENT	PSEUDO (40 μ sec)
Pulses	3 or 7	✓	4 or 8	✓	✓
Direction	1 or 5	✓	2 or 6	✓	✓

(b)

"SME 1 ON MUX":

IF SME (1) is ON (✓)

IF SME (2) is ON (✓)

Logic 1

4.5 to 5.5 volts

Logic 0

0 to 0.8 volt Pass Fail

Date 3/6/81 QA Stamp



Test Flow Event

Tested by

Comments

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DATA SHEET 4.3.7-1
RELIABILITY CHECKS
AUTOMATIC TESTS

TS 32015-004

[illegible]

attach to data sheet 4.3.7-1 operability check, 2; tapeAT-FM, trk0, file2, rev121880

OPERABILITY CHECK
AUTOMATIC CHECK

SNA Designation: F-1 ACCEPT TEST
 Serial Number: 4
 Run Number: 30681.1446
 operation: SME(2) SAK
 Test Flow Event: N-5
 Sequence Number: 6

TEMPERATURES	T1 (+Z)	T2 (-Z)	T3 (+X)	T4 (-X)	T5 (BRDG)	T6 (SAM)	T7 (SME)	T8 (-Z-X)	T9 (+Z-X)
deg C	29.7	28.4	28.8	29.4	29.0	29.9	34.0	28.1	28.0

SMA POWER SUPPLIES	measured HIGH	supply rms volts	measured mamps	spec mamps	P/F
+27	30.7	28 to 30	27.0	200	P
-27	30.6	-28 to -30	26.2	200	P
-6.8	8.0	6.3 to 7.7	2244.9	2500	P

BILLEVEL DIGITAL		SME(1) ON		SME(2) ON		SAM(1)/BUMPER(2)	
TELEMETRY,volts		0.4		4.3		0.2	

MODE
SME(2),SAM

PRESSURE, torr 0.6 req'd ≤ 2

TORQUE PULSES, usec (100 scans)	mean	sigma	req'd
TAU A	799.0	0.3	600 to 1000
TAU B	745.3	0.3	600 to 1000

ACTIVE SCAN TIME,usec (100 scans)	combined mean	req'd 60742.8	sigma 0.3	req'd 2.9	P P
	60742.9	to 60743.2			

TURN-ON TIME, sec 8.2 spec <= 60
(time to reach within 10usec of active scan line)

Tested by

QA Stamp

ਅੰਤਰ-ਰਾਸ਼ਟਰੀ - ੨੩

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Data Date: 01/88:

Data Time: 11:11:11

RMA Designation: F-1 ACCEPT TEST
Serial Number: 4
Run Number: 30681.144E
Test Flow Event: N
Sequence Number: 6

SAM MODE operation

scan N: 99 no. of words transferred = 32

Line Length, N-1: 377 040 016 000
Active Scan Time, N-1: 60743.00
Final Time, N: 60743.30

TELEMETRY

Byte No	Name	Contents	Pulses	Time(usec)
1	SYNC	246		
2	OPSTAT N	106	Bit 7 = 0: Scan N= Forward	
3	SCNLIN N	130	88	16.58
4 5	TRNERR N	003 373	1019	192.03
6 7	TORPLS N	360 214	-3956	-745.51
8 9	SHSERR N-1	377 362	-14	-2.64
10 11	FHSERR N-1	000 016	14	2.64
12 13 14	SUMERR N-1	377 360 214	-3956	-745.51
15 16	SCNCTR	003 353		
17	SCNLIN N-1	250	-88	-16.58
18 19	TRNERR N-1	001 150	360	67.84
20 21	TORPLS N-1	357 236	-4194	-790.36
22 23	SHSERR N-2	000 030	24	4.52
24 25	FHSERR N-2	377 347	-25	-4.71
26 27 28	SUMERR N-2	377 357 240	-4192	-789.98
29 30 31	SCNTYM N-2	004 353 032	322330	60743.20
32	NSCANS	037	No.Scans =	31 (decimal)

scan N:100 no. of words transferred = 31

Line Length, N-1: 001 217 350 377
Active Scan Time, N-1: 60743.00
Final Time, N: 60743.30

TELEMETRY

Byte No	Name	Contents	Pulses	Time(usec)
1	SYNC	246		
2	OPSTAT N	306	Bit 7 = 1: Scan N= Reverse	
3	SCNLIN N	250	-88	-16.58
4 5	TRNERR N	001 147	359	67.63
6 7	TORPLS N	357 240	-4192	-789.98
8 9	SHSERR N-1	000 030	24	4.52
10 11	FHSERR N-1	377 350	-24	-4.52
12 13 14	SUMERR N-1	377 357 240	-4192	-789.98
15 16	SCNCTR	003 354		
17	SCNLIN N-1	130	88	16.58
18 19	TRNERR N-1	003 373	1019	192.03
20 21	TORPLS N-1	360 214	-3956	-745.51
22 23	SHSERR N-2	377 362	-14	-2.64
24 25	FHSERR N-2	000 016	14	2.64
26 27 28	SUMERR N-2	377 360 214	-3956	-745.51
29 30 31	SCNTYM N-2	004 353 031	322329	60743.01
32	NSCANS	037	No.Scans =	31 (decimal)

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TS 32015-004
Rev. B

DATA SHEET 4.3.7-2: OPERABILITY CHECKS

Manual Tests

SMA Designation F-1 S/N 4 SHE(1) (b) SHE(2) (b) ✓

Step

(a)

MUX Pulse Interfaces

Place check in blocks indicated after observing the waveforms (see Figure 4.3-12). The signal low should be 40 ± 40 mV; and the signal high should be 650 ± 40 mV. The pulse duration should be from 300 μ sec to 400 μ sec. (For Points SAEs just confirm their presence with a check)

SIGNAL	SWITCH POSITION	NORM	SWITCH POSITION	COMPLEMENT	PSEUDO (40- μ sec)
Pulses	3 or 7	✓	4 or 8	✓	✓
Direction	1 or 5	✓	2 or 6	✓	✓

(b)

"SHE 1 ON MUX":

Logic 1
Logic 0

IF SHE (1) is ON (✓)

4.5 to 5.5 volts

IF SHE (2) is ON (✓)

0 to 0.8 volt Pass Fail

Date 3/8/81 QA Stamp



Test Flow Event ✓

Tested by B

Comments

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DATA SHEET 4.3.7-1
OPERABILITY CHECKS
AUTOMATIC TESTS

TS 32015-004

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attach to data sheet 4.3.7-1 operability check, 2; tape AT-FM, trk 0, file 2, rev 121880

OPERABILITY CHECK
AUTOMATIC CHECK

SMA Designation: F-1 ACCEPT TEST
Serial Number: 4
Run Number: 30681.1454
Operation: SME(2) BUMPER
Test Flow Event: N-7
Sequence Number: 6

TEMPERATURES	T1	T2	T3	T4	T5	T6	T7	T8	T9
	(+2)	(-2)	(+X)	(-X)	(BRDG)	(SAM)	(SME)	(-2-X)	(+2+X)
deg C	29.7	28.4	28.8	29.4	29.0	29.8	33.8	28.1	28.0

SMA POWER SUPPLIES	measured HIGH	supply rms volts	measured mamps	spec mamps	P/F
+27	30.7	28 to 30	27.8	200	P
-27	-30.6	-28 to -30	27.0	200	P
-5.8	8.0	6.3 to 7.7	2256.2	2500	P

BILEVEL DIGITAL TELEMETRY, volts
SME(1) ON SME(2) ON SAM(1)/BUMPER(2)
0.3 4.3 3.9

MODE
SME(2), BUMPER

PRESSURE, torr 0.7 req'd <= 2

TORQUE PULSES, usec (100 scans)	mean	sigma	req'd
TAU A	815.6	0.5	---
TAU B	896.0	0.6	---

BUMPER-BUMPER TIME, usec (100 scans)	mean	sigma	req'd
	71342.9	71342.2 to 71343.8	2.9

TURN-ON TIME, sec
(time to reach within 10 usec of active scan time)
7.9 spec <= 60

Tested by

QA Stamp



Test Time: 1454

Test Description: F-1 RECEIPT TEST
Test Number: 4
Test Number: 30681.1454
Test Flow Event: N
Sequence Number: 6

UNDER MODE operation

can N: 99 no. of words transferred = 32

Line Length, N-1: 005 306 317 000
Bumper to Bumper Time, N-1: 71342.6
Final Time, N: 60743.11

TELEMETRY

Byte No	Name	Contents	Pulses	Time(usec)
1	SYNC	246		
2	OPSTAT N	146		
3	SONLIN N	130	88	16.58
4	5 TRNERR N	000 000	0	0.00
6	7 TORPLS N	355 162	-4750	-895.14
8	9 SHSERR N-1	000 000	0	0.00
10	11 FHSEPP N-1	000 000	0	0.00
12	13 SUMERR N-1	377 355 161	-4751	-895.33
15	16 SONCTR	004 062		
17	SONLIN N-1	250	-88	-16.58
18	19 TRNERR N-1	000 000	0	0.00
20	21 TORPLS N-1	357 027	-4329	-815.80
22	23 SHSERR N-2	000 000	0	0.00
24	25 FHSEPP N-2	000 000	0	0.00
26	27 SUMERR N-2	377 357 026	-4330	-815.99
28	30 SCNTYM N-2	004 353 027	322327	60742.64
32	NSCANS	037	No.Scans =	31 (decimal)

can N: 100 no. of words transferred = 31

Line Length, N-1: 005 306 324 377
Bumper to Bumper Time, N-1: 71343.5
Final Time, N: 60743.11

TELEMETRY

Byte No	Name	Contents	Pulses	Time(usec)
1	SYNC	246		
2	OPSTAT N	346		
3	SONLIN N	250	-88	-16.58
4	5 TRNERR N	000 000	0	0.00
6	7 TORPLS N	357 024	-4332	-816.37
8	9 SHSERR N-1	000 000	0	0.00
10	11 FHSEPP N-1	000 000	0	0.00
12	13 SUMERR N-1	377 357 027	-4329	-815.80
15	16 SONCTR	004 062		
17	SONLIN N-1	130	88	16.58
18	19 TRNERR N-1	000 000	0	0.00
20	21 TORPLS N-1	355 162	-4750	-895.14
22	23 SHSERR N-2	000 000	0	0.00
24	25 FHSEPP N-2	000 000	0	0.00
26	27 SUMERR N-2	377 355 161	-4751	-895.33
28	30 SCNTYM N-2	004 353 027	322327	60742.64
32	NSCANS	037	No.Scans =	31 (decimal)

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TS 32015-0000
Rev. B

DATA SHEET 4.3.7-2: OPERABILITY CHECKS

Manual Tests

SMA Designation F-1 S/N 4 SWE(1) (M) SWE(2) (M) ✓

Step

Brpt

(a)

MUX Pulse Interfaces

Place check in blocks indicated after observing the waveform (see Figure 4.3-12). The signal low should be 40 ± 40 m volts, and the signal high should be 600 ± 40 mv. The pulse duration should be from 300 μ sec to 400 μ sec. (For Pseudo SAMS just confirm their presence with a check)

SIGNAL	SWITCH POSITION	NORM	SWITCH POSITION	COMPLEMENT	PSEUDO (45 μ sec)
Pulses	3 or 7	✓	4 or 8	✓	
Direction	1 or 5	✓	2 or 6	✓	

(b)

"SWE 1 ON MUX":

IF SWE (1) is ON (✓)

IF SWE (2) is ON (✓)

Logic 1

4.5 to 5.5 volts

Logic 0

0 to 0.8 volt Pass Fail

Date 3/6/81 QA Stamp



Test Flow Event N

Tested by B

Comments

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DATA SHEET 4.3.5-1
OPERATIONAL PERFORMANCE
SCAN TO SCAN REPEATABILITY

TS 32015-004
8 March 1980

SMA Designation F-1 ACCEPT TEST

S/N: 4

SAW NOISE

1

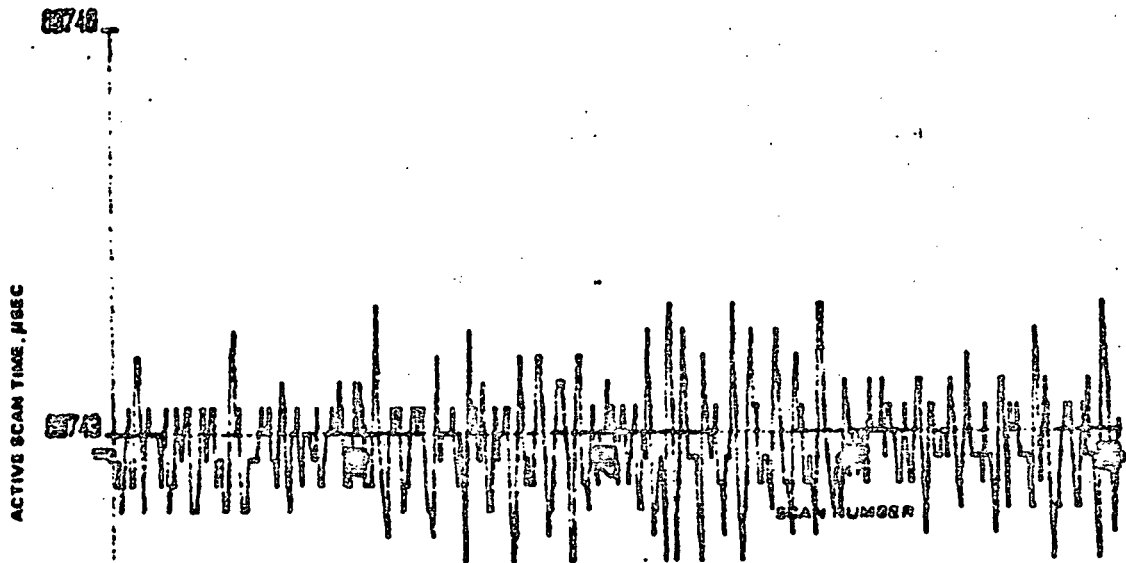
SME (1) or (2):

Voltage: High ☒ , Nom ☐ , Low ☐

31.7 -31.6 0.8

400 CONSECUTIVE
(200 FWD, 200 REV)

200 FWD
200 REV



	CLOCK-CORRECTED LINE-LENGTH, μ SEC					
	MEAN	SPEC	P/P	ONE-SIGMA	SPEC	P/P
FWD	31.72	31.73 +0.2	P	1.33	0 TO 2.9	P
REV	31.72	31.73 +0.3	P	1.33	0 TO 2.9	P

Run No. 32001.155

Test Flow Event H-9 seq 6

Comments test no. 9

QC Stamp

Date

3/6/81

Tested By

Thick
rest

5

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DATA SHEET 4382
OPERATIONAL PERFORMANCE
SCAN PARAMETERS

TS 32015-004

Rev 3

400 Scan Parameters (upset), rev12186

OPERATIONAL PERFORMANCE
SCAN PARAMETERS

SMA Designation: F-1 ACCEPT TEST
Serial Number: 4
Run Number: 30681.1500
temperatures T1 T2 T3 T4 T5 T6 T7 T8 T9
(+Z) (-Z) (+X) (-X) (BRDG) (SAM) (SME) (-Z-X) (+Z+X)
deg C 29.7 28.5 28.8 29.4 29.1 30.0 34.4 28.2 28.0

operation: SME(1) SAM
Test Flow Event: N-9 Sea 6
Voltages: 30.7 -30.6 8.

SCAN PARAMETER (400 scans)	MEASURED	REQUIREMENT	SPECIFICATION	P/F
clock freq: HZ	10612842	10612875 +-125		P
torque pulse width: usec				
mean	771	<1100		P
sigma	23			
turn-around time: usec		10590 +- 60		P
bumper A: mean	10553.5			P
sigma	0.2			
bumper B: mean	10539.8			P
sigma	0.3			
active scan time: usec				
fwd: min	60742.1			
max	60743.9			
mean	60742.9			
sigma	0.4			
rev: min	60742.1			
max	60743.9			
mean	60742.9			
sigma	0.4			
combine: mean	60742.9		60743 +-0.2	P
sigma	0.4		<2.9	P
scan period: usec	142679.1	142666 +-140		P
scan rate var: percent			+ -1	P
fwd: min	-0.001			P
max	0.002			P
rev: min	-0.001			P
max	0.002			P
SAM offset (P0 mean): urad	0.07			
line start pulse angular jitter (P0 sigma): urad	0.16		<1.00	P
SAM angle: urad				
fwd: mean	134560			
sigma	0.74		<1	P
rev: mean	134562			
sigma	0.34		<1	P

Mr. Tolson and Mr. Boardman

[illegible]

DATE: 030520 TIME: 1500

```

CNR Description:      F-1 ACCEPT TEST
Serial Number:        4
Pul Number:           30681.1500
Test Flow Event:      N
Test Number:          9
Sequence Number:      6
Serials:              7.00E-01 TORR

```

INITIALIZE Words Transferred: 4

Word Number 9: INTERRUPT (Row 177771 Octal)

Ext.	Description	Setting
0	Panel Mode	1
1	Calibrate Mode	0
2	Scan Mode	0

4. Number 1: PANEL STATUS (Rev 042402 Oct 01)

Bit	Description	Setting
0	Bumper SW On	0
1	Bee SAM P0/P3	1
2	Bee SAM P2/P5	0
3	Bee SAM PA/PB	0
45	Processed SAM	1
45	Raw SAM	0
45	SAM 1 or SAM 2	0
45	SAM 3 (CAL SAM?)	0
6	Single Reset	0
7	End SAM P0/P3	0
8	End SAM P2/P5	1
9	End SAM PD/PE	0
10	Ext Reset	1
11	5 Facet	0
12	Calibrate Mode	0
13	Scan Mode	0
14	Initialize Mode	1
15	Slow Telemetry Mode	0

W --- Numbers 2 and 3: (Row 000000 007157 Octal)

```
Scan Count Preset:      7157 Octal      No. of Scans:      400
Time Count Preset:      00000000        No. of Samples:      0
```

```

Number of Scans of S$ Dimension: 400
Dimension of S$ Array: 15226
Dimension of W$ Array: 800

```

CALIBRATE: SAM/SME: 1

LFacet	IFAR Counts	Preset Angles	No. of b
P0P5	0.00	-6.7170900E-02	1.6392000E 05
P1P4	12320.00	0.0000000E 00	2.4423910E 06
P2P3	177340.00	6.7159200E-03	-1.2645250E 04

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Sample 1: 3.00
Sample 2: 3.00

Tape Measures and Voltages

Ch	Source Out	Device	Col	Measurement
3	-1.0000E 04	QUARTER	3	ERROR
1	2.2008E-02	EU=6.8I	5	2230.800 mAmps
2	1.4530E-03	EU=+27I	5	29.060 mAmps
3	-1.2570E-03	EU=-27I	5	25.140 mAmps
4	1.7585E 03	SMA -Z	1	28.475 Dec C
5	1.6949E 03	SMA -X	1	29.387 Dec C
6	1.6712E 03	SMA +Z	1	29.726 Dec C
7	1.7043E 03	SMA +X	1	28.822 Dec C
8	1.7179E 03	TORQ BRDG	1	29.058 Dec C
9	7.1508E 02	SME TEMP	2	34.395 Dec C
10	1.6504E 03	SAM TEMP	1	30.030 Dec C
11	7.9937E 00	EU=6.8V	4	7.994 Volts
12	8.5919E 03	MF(-Z-X)	3	28.192 Dec C
13	8.6122E 03	MF(+Z-X)	3	28.032 Dec C
14	4.3354E 00	SME(1)TEL	4	4.335 Volts
15	2.3488E-01	SME(2)TEL	4	0.235 Volts
16	-1.0000E 04	SME PR U7	3	ERROR
17	3.8876E 00	SAM1/BMP2	4	3.888 Volts
18	3.0681E 01	EU=+27V	4	30.681 Volts
19	-3.0562E 01	EU=-27V	4	-30.562 Volts

=====

IF 'ERROR 60' OCCURS DURING MARKING OF TAPE:

type:to REMARK---press execute---press continue

=====

ota Tape Identifier: F1D7

Track for Data: 1

Init/Cal Data File Number: 7

Scan Data File Number: 8

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DATA SHEET 4.3.5-1
OPERATIONAL PERFORMANCE
SCAN TO SCAN REPEATABILITY

TS 32015-004
8 March 1980

SMA Designation: ACCEPT TEST

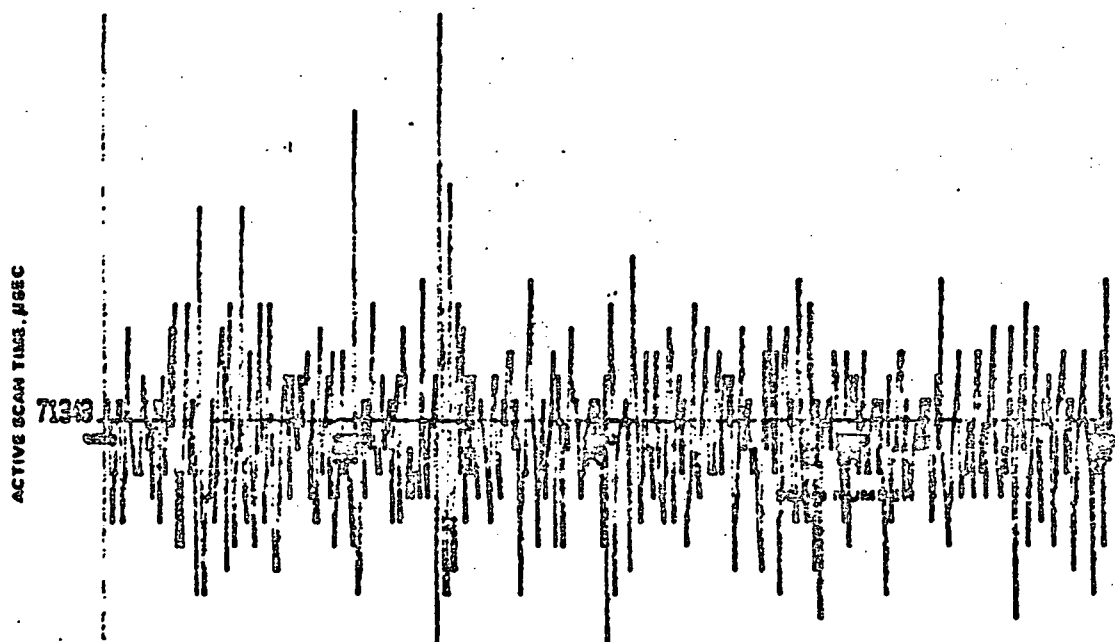
S/N: 4 **BUFFER MODE**
SME (1) or (2): 1

Voltage: High ☒ , Nom ☐ , Low ☐

22.7 -2.8 2.8

400 CONSECUTIVE
(300 FWD, 200 REV)

200 FWD
200 REV



	CLOCK-CORRECTED LINE LENGTH, μ SEC					
	MEAN	SPEC	P/P	ONE-SIGMA	SPEC	P/P
FWD	71342.68	71343	P	2.02	0 TO 2.0	P
REV	71342.88	71343	P	2.04	0 TO 2.0	P

Run No. 3663L1500

Test Flow Event H-11 seq 6

Comments test no. 11

QC Stamp  Date 3/6/81

Tested By 

ORIGINAL PAGE IS
OF POOR QUALITY

TS 32015-004

DATA SHEET 4.152
OPERATIONAL PERFORMANCE
SCAN PARAMETERS

attach to data sheet 4.3.5-2

OPERATIONAL PERFORMANCE SCAN PARAMETERS

[illegible]

SCAN PARAMETER(400 scans)	MEASURED	REQUIREMENT	SPECIFICATION	P/F
1				
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99				
100				

clock freq; HZ	10612841	10612875	+125	P

torque pulse width, usec	860	<1100	P
mean			
sigma	7		

bumper to bumper time, usec	71341.6	
fwd: min	71346.2	
max	71342.9	
mean	0.6	
sigma	71341.1	
rev: min	71344.7	
max	71342.9	
mean	0.6	
sigma	71342.9	
combine: mean	71342.9	71343 +0.8
sigma	0.6	<2.9
scan period, usec	142685.7	142686 +-1.6

mean	rate	var,	percent
std:	min		-0.002
	max		0.005
rev:	min		-0.003
	max		0.003

Tested by

NO. REQ'D = 22

45 Data collection: litapeAT-File:ark1+file4, rev0121890

Temperatures and Voltages

Ch	Scanner Out	Device	Cal	Measurement
4	1.7195E 03	SNH -Z	1	28.461 Deg C
12	8.5906E 03	NF(-Z-X)	3	28.292 Deg C
13	8.6866E 03	NF(+Z+X)	3	28.124 Deg C

Date: 030681 Time: 1508

ORIGINAL PAGE IS
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SM. Designation: F-1 ACCEPT TEST
 Serial Number: 4
 Rq. Number: 30681.1508
 Test Flow Event: N
 Test Number: 11
 Sequence Number: 6
 Pressure: 7.50E-01 TORR

INITIALIZE Words Transferred: 4

Word Number 0: INTERRUPT (Raw 177771 Octal)

Bit	Description	Setting
0	Panel Mode	1
1	Calibrate Mode	0
2	Scan Mode	0

Word Number 1: PANEL STATUS (Raw 040402 Octal)

Bit	Description	Setting
0	Bumper SW On	0
1	See SAM P0/P3	1
2	See SAM P2/P5	0
3	See SAM PA/PB	0
45	Processed SAM	1
45	Raw SAM	0
45	SAM 1 or SAM 2	0
45	SAM 3 (CAL SAM)	0
6	Single Reset	0
7	End SAM P0/P3	0
8	End SAM P2/P5	1
9	End SAM PA/PB	0
10	Ext Reset	0
11	5 Facet	0
12	Calibrate Mode	0
13	Scan Mode	0
14	Initialize Mode	1
15	Slow Telemetry Mode	0

Word Numbers 2 and 3: (Raw 000000 007157 Octal)

Scan Count Preset:	7157 Octal	No. of Scans:	400
Time Count Preset:	0000000	No. of Samples:	0

Number of Scans of S# Dimension: 400

Dimension of S# Array: 15226

Dimension of W# Array: 800

CALIBRATE: SAM/SNE: 1

Facet	IFAR Counts	Preset Angles	No. a, b
P0P5	0.00	-6.7170900E-02	1.6392000E 05
P1P4	163920.00	0.0000000E 00	2.4423910E 06
P2P3	327940.00	6.7159200E-02	-1.2645252E 04

= 0.500000

ORIGINAL PAGE IS
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Bumper A: 0.00
Bumper B: 0.00

Dimension of H# Array: 800

Temperatures and Voltages

Ch	Scanner Out	Device	Cal	Measurement
0	-1.0000E-04	QUARTER	3	ERROR
1	2.2355E-02	EU=6.8I	5	2235.500 mAmps
2	1.5080E-03	EU=+27I	5	30.160 mAmps
3	-1.2580E-03	EU=-27I	5	25.760 mAmps
4	1.7564E 03	SMA -Z	1	28.505 Deg C
5	1.6905E 03	SMA -X	1	29.449 Deg C
6	1.6662E 03	SMA +Z	1	29.798 Deg C
7	1.7321E 03	SMA +X	1	28.854 Deg C
8	1.7157E 03	TORQ BRIG	1	29.089 Deg C
9	7.0858E 02	SME TEMP	2	34.632 Deg C
10	1.6404E 03	SAM TEMP	1	30.209 Deg C
11	7.9901E 00	EU=6.9V	4	7.990 Volts
12	8.5878E 03	MF(-Z-X)	3	28.224 Deg C
13	8.6075E 03	MF(+Z+X)	3	28.070 Deg C
14	4.3361E 00	SME(1)TEL	4	4.336 Volts
15	4.1321E-01	SME(2)TEL	4	0.413 Volts
16	-1.0000E 04	SME PR U7	3	ERROR
17	1.7860E-01	SAM1/BMP2	4	0.179 Volts
18	3.0681E 01	EU=+27V	4	30.681 Volts
19	-3.0561E 01	EU=-27V	4	-30.561 Volts

=====

IF 'ERROR 60' OCCURS DURING MARKING OF TAPE:

type:sto REMARK---press execute---press continue

=====

Data Tape Identifier: F1D7

Track for Data: 1

Init/Cal Data File Number: 9

Scan Data File Number: 10

ORIGINAL PAGE IS
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263

TS 32015-004
8 March 1980

DATA SHEET 4.3.5-3
OPERATIONAL PERFORMANCE
ALONG SCAN GEOMETRIC REPEATABILITY

SAW MODE (and calibrated)
SPE (1) or (2) 1

SMA Designation F-1 ACCEPT TEST S/N 4

Voltage: High __, Nom __, Low __

IPAR COUNTS:

CALIBRATION

BUMPER A

P2 P3

MID - P1 P4

P0 P5

BUMPER B

SCANNING

MEAN
VALUES

P2

2.7

P3

2.8

P1

6.8

P4

1.2

P0

2.8

P5

3.3

2.8

LAST P0

3.3

K = 8.500280

TEMP: T1 T2 T3 T4 T5 T6 T7 T8 T9 T10

29.9 22.6 22.1 22.6 22.2 22.4 35.1 22.3 22.2

SAW ANGLES

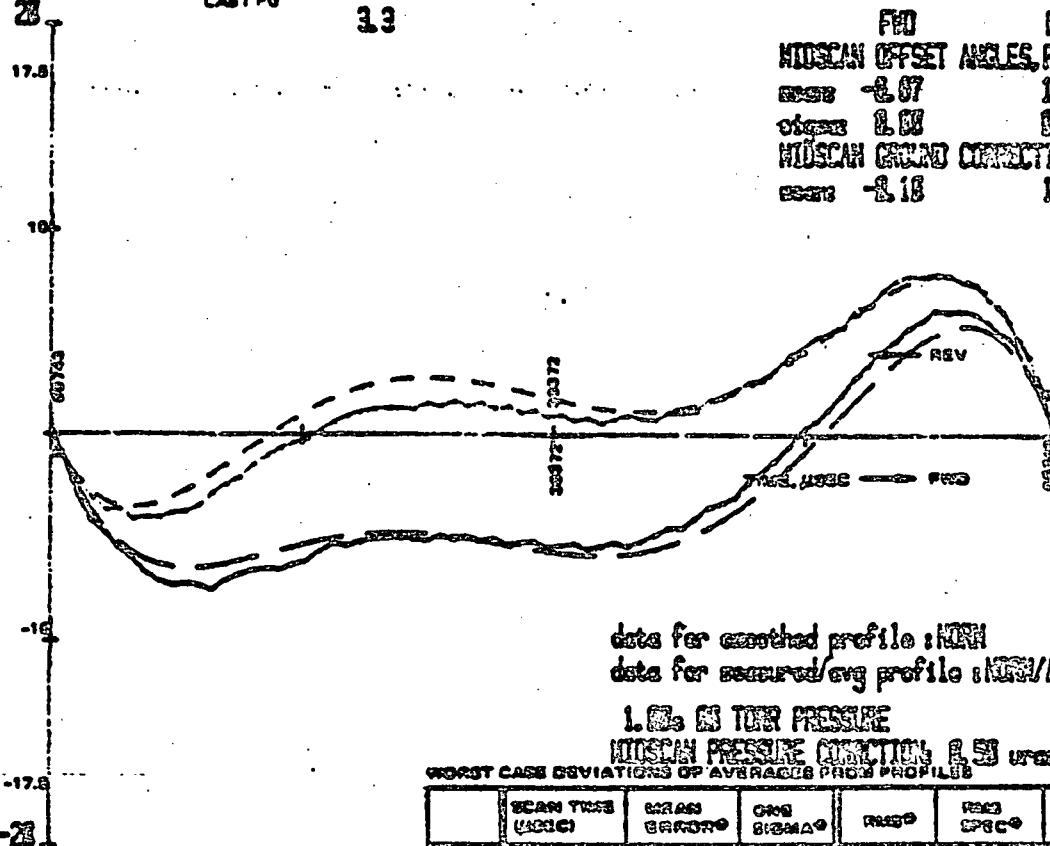
USED (MRAD)

-57.171 57.159

PWD SMOOTHED PROFILE
LEADON-225-H RUN NO 220 15.8
REV SMOOTHED PROFILE
MEASURED AVE, PWD
MEASURED AVE, REV

FWD REV
MIDSCAN OFFSET ANGLES, PH16, PH17
mean -0.07 1.15
sigma 0.02 0.02
MIDSCAN GRAD CORRECTION
mean -1.18 1.01

NON-LINEARITY, MRAD



data for smoothed profile: NON
data for measured/avg profile: NON/AVG

1.0% IN TON PRESSURE
MIDSCAN PRESSURE CORRECTION 1.50 used

WORST CASE DEVIATIONS OF AVERAGES FROM PROFILE

	SCAN TIME (SEC)	MEAS ERROR	ONE SIGMA	MEAS	REAS SPEC	P/P
FWD	00112.33	1.03	1.46	1.13		
REV	00346.47	-1.23	1.23	1.23	<1.75	P

MICRORADIANS

Run No. 30581.1541

QA Stamp

Date 3/20/81

Test Flow Event K-13 eq 8

Tested By

Comments test no 13.19 FWD/REV SCAN 75pts each

ORIGINAL PAGE IS
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TS 32015-004
8 March 1980

DATA SHEET 4.3.3
OPERATIONAL PERFORMANCE
ALONG SCAN GEOMETRIC REPEATABILITY

SMA Designation F-1 ACCEPT TEST 3/N4

SAW HIDE (and calibrated) deviation profile
SAG (1) or (2) 1 Voltage: High Nom Low

IFAR COUNTS:

CALIBRATION

SUMPER A

P2 P3

MID - 01 P0

P0 P0

SUMPER B

SCANNING

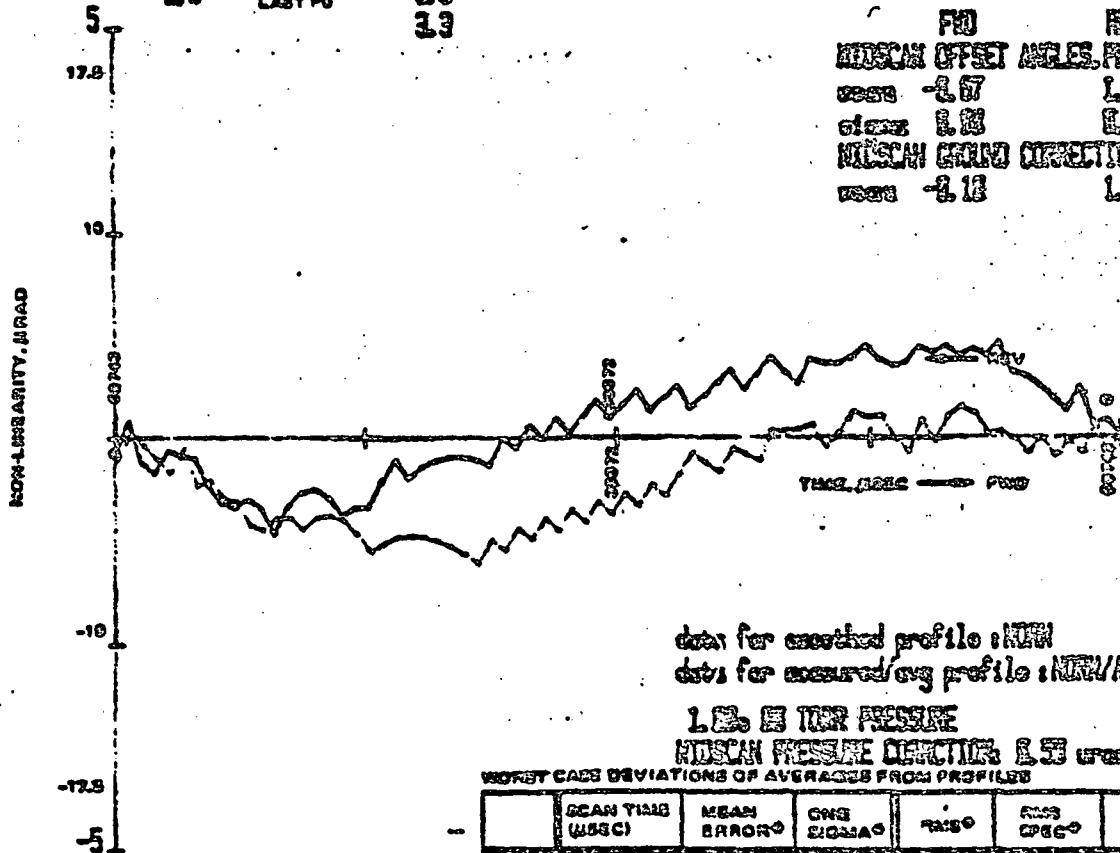
SCAN OFFSETS, #RAD

MEAN VALUES	P2	27	P3	28
	P1	0.0	P4	L2
	P0	2.9	P5	L3
			LAST P0	L3

TEMP: T1 T2 T3 T4 T5 T6 T7 T8 T9 T10
21.0 21.0 21.0 21.0 21.2 21.4 21.1 21.3 21.2
SCAN ANGLES
USED (MRAD) -07.171 07.130

PWD SMOOTHED PROFILE
(FROM TPE-M RUN NO. 21.130)
REV SMOOTHED PROFILE
MEASURED AVG, PWD
MEASURED AVG, REV

PWD	REV
MIDSCAN OFFSET ANGLES, #RAD	
used -1.07	L15
used 1.07	L15
MIDSCAN CORRECTION	
used -1.12	L15



data for smoothed profile: NEW
data for measured avg profile: NEW/AVE

1.05 IN TOR PRESSURE

MIDSCAN PRESSURE CORRECTION: 1.33 used

WORST CASE DEVIATIONS OF AVERAGES FROM PROFILES

	SCAN TIME (MSEC)	MEAN ERROR	ONE SIGMA	TWO	THREE	P/P
PWD	40110.38	1.03	1.46	1.13		
REV	30340.47	-1.20	1.23	1.25	-01.70	P

0 MICRORADIANS

Run No. 3581.1541

Test Flow Event N-13 seq 8

Comments test no. 13 10 000/19 REV SCAN Type each

QA Stamp

Date 3/8/80

Tested By

ORIGINAL PAGE IS
OF POOR QUALITY

265

TS 32015-004

8 March 1980

DATA SHEET 4.3.8-4
OPERATIONAL PERFORMANCE
CROSS SCAN REPEATABILITY

SMA Designation F-1 ACCEPT TEST S/N

SAN NIXE SME (1) or (2) }

Voltage: High ☒ , Nom ☐ , Low ☐

317 -316 89

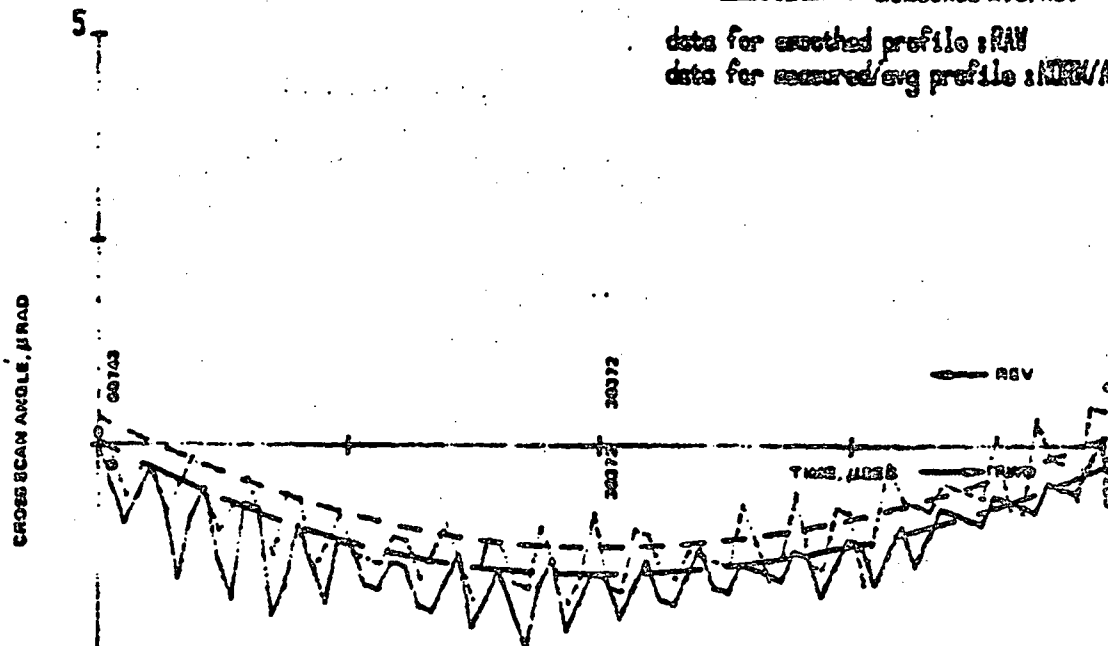
FORWARD LINEAR IFAR-ALIGNMENT
TERM REMOVED:

95.93 urad

(FROM TPE-P RUN NO.

— PWD SMOOTHED PROFILE
(FROM TPE-P RUN NO. 1541)
--- REV SMOOTHED PROFILE
- - - MEASURED AVG. PWD
- - - MEASURED AVG. REV

data for smoothed profile: RAW
data for measured avg profile: MEW/AVG



WORST CASE DEVIATIONS OF AVERAGES FROM PROFILES 00						
	SCAN TIME (MSEC)	MEAN ERROR	ONE SIGMA	RMS	RMS SPEC	P/P
PWD	1518.45	-1.17	1.17	1.17		?
REV	4773.53	-1.12	1.12	1.12	<1.5	?

PRESSURE:

1.122 M

0 MICRORADIANS
00 AFTER REMOVING THE LINEAR
IFAR-ALIGNMENT TERM THAT WAS REMOVED
FROM THE ORIGINAL PROFILE

Run No. 32591.1541

Test Flow Event H-13 esq 8

Comments test no. 13

QA Stamp

Date 3/25/81

Tested By

ORIGINAL PAGE IS
OF POOR QUALITY

266

...:SMI-FM:tr:0:1:1:4:rec:022781

=====71 INITIAL CONDITIONS=====

- (1) Fans must be off for at least 20 min.
- (2) Light Lamps must be on at least 45 min
- (3) BPS temp (+Z-X) must be +/-1 deg from (-Z-X)
- (4) Chamber pressure must be less than 2 torr
- (5) Cross axis polarity correct

=====

Temperatures and Voltages

Ch	Boarder Out	Device	Cal	Measurement
4	1.7500E 03	SMA -Z	1	28.565 Deg C
12	8.5751E 03	MF(-Z-X)	3	28.316 Deg C
13	8.5890E 03	MF(+Z-X)	3	28.215 Deg C

Date: 030691 Time: 1541

SMA Designation: F-1 ACCEPT TEST
Serial Number: 4
Run Number: 30691:1541
Test Flow Event: N
Test Number: 13
Sequence Number: 6

INITIAL Words Transferred: 4

Word Number 0: INTERRUPT (Raw 177771 Octal)

Bit	Description	Setting
0	Panel Mode	1
1	Calibrate Mode	0
2	Scan Mode	0

Word Number 1: PANEL STATUS (Raw 042402 Octal)

Bit	Description	Setting
0	Bumper SW On	0
1	Bee SAM P0/P3	1
2	Bee SAM P2/P5	0
3	Bee SAM PA/PB	0
45	Processed SAM	1
45	Raw SAM	0
45	SAM 1 or SAM 2	0
45	SAM 3 (CAL SAM)	0
6	Single Reset	0
7	End SAM P0/P3	0
8	End SAM P2/P5	1
9	End SAM PD/PE	0
10	Ext Reset	1
11	5 Facet	0
12	Calibrate Mode	0
13	Scan Mode	0
14	Initialize Mode	1
15	Slow Telemetry Mode	0

Word Numbers 2 and 3: (Raw 176747 057730 Octal)

Scan Count Preset:	7730 Octal	No. of Scans:	39
Time Count Preset:	3757165	No. of Samples:	75

Number of Scans of 32 Dimension: 41
Scans x Samples: 3875
Number of Samples plus 1: 76
Disposition of 32 Scans: 14950

6 Division of W4 Arrow:

82

ORIGINAL PAGE IS
OF POOR QUALITY

267

LA TIBRATE: SAM/SME: 1

-----P0P5-----

Along: Cross: A-Octal-B: Minutes: 943.55
1.22 -0.84
Along 0.41 0.90

-----BUMPER B-----

Along: Cross: A-Octal-B: Minutes: 944.12
-3225.17 1.00
Along 0.00 0.00

-----P1P2-----

Along: Cross: A-Octal-B: Minutes: 944.32
164234.17 115.10
Along 0.00 0.92

-----BUMPER A-----

Along: Cross: A-Octal-B: Minutes: 944.83
331971.91 0.00
Along 0.00 0.00

-----P2P3-----

Along: Cross: A-Octal-B: Minutes: 945.05
328408.93 236.73
Along 0.00 0.91

-----P0P5-----

Along: Cross: A-Octal-B: Minutes: 945.70
1.00 -0.91
Along 0.00 0.29

Along Scan Calibration

Time at end of Cal: 1545.42

Facet	IFAR Counts		Preset Angles	No. a, b
P0P5	1.00	-0.91	-6.7170900E-02	1.6423403E 05
P1P4	164234.03	115.02	0.0000000E 00	2.4466219E 06
P2P3	328408.93	236.70	6.7159200E-02	1.3115961E 04

R = 0.500000

Bumper A: 331971.91

Bumper B: -3225.17

CROSS SCAN conversion factor: 0.409urad/IFAR count

CROSS AXIS THERM DRIFT RATE: 0.01urad/min

CROSS SCAN linear term desired: 97.19urad

data collection: 2; tape AT-FM; trk 0; file 5; rev 22681

Time at end of SCAN: 1546.32 945.53

Time between Cal and Scan: 0.90min

CROSS AXIS DRIFT: (last P0 to SCAN): -0.01urad

CROSS AXIS REFERENCE OFFSET: -0.39urad

ORIGINAL PAGE IS
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	Source	Unit	Measurement
0	-1.0000E 04	QUARTER	ERROR
1	2.4621E-02	EU=6.81	2282.100 mAmps
2	1.4120E-03	EU=+27V	28.880 mAmps
3	-1.2120E-03	EU=-27V	24.643 mAmps
4	1.7487E 03	SMA -Z	28.816 Deg C
5	1.6322E 03	SMA -X	29.568 Deg C
6	1.6561E 03	SMA +Z	29.943 Deg C
7	1.7238E 03	SMA +X	28.976 Deg C
8	1.7053E 03	TORQ BRDG	29.235 Deg C
9	6.9791E 02	SME TEMP	35.073 Deg C
10	1.6287E 03	SAM TEMP	30.419 Deg C
11	7.9902E 00	EU=6.8V	7.990 Volts
12	8.5729E 03	MF(-Z-X)	28.341 Deg C
13	8.5951E 03	MF(+Z+X)	28.167 Deg C
14	4.3844E-01	SME(1)TEL	0.438 Volts
15	4.3467E 00	SME(2)TEL	4.347 Volts
16	-1.0000E 04	SME PR U7	ERROR
17	1.7908E-01	SAM1/BMP2	0.179 Volts
18	3.0682E 01	EU=+27V	30.682 Volts
19	-3.0562E 01	EU=-27V	-30.562 Volts

Data Tape Identifier: F1D8
Track for Data: 0
Init/Cal Data File Number: 1
Scan Data File Number: 2
Norm/Avg Scan Data File Number: 3

=====

IF 'ERROR' OCCURS DURING MARKING OF TAPE:

1. PAUSE REWIND - Press a scout - Press continue

=====

TELEMETRY PRINTOUT: 2: tape AT-F: trk 0 file 6 rev 22381

Data Date: 000000 Time: 1541

ORIGINAL PAGE IS
OF POOR QUALITY

Mission: F-1 ACCEPT TEST
 Serial Number: 4
 Run Number: 30681.1541
 Test Flow Event: N
 Test Number: 13
 Sequence Number: 5

Data tape identifier: F1D8
 Check for data: 0
 IN TCAL data file number: 1
 SCAN data file number: 2
 NORM/AVG SCAN data file number: 3
 Sp. Corrh. Coeffs file number: 0

Mode selected: NORM/AVG

TELEMETRY PRINTOUT: 2: tape AT-F: trk 0 file 6 rev 22381

Data Date: 000000 Data Time: 1541

Scan MODE operation

Scan N: 1 no. of words transferred = 187

Line Length, N-1: 377 060 014 000

Active Scan Time, N-1: 60743.19

Final Time, N: 60743.48

TELEMETRY

Byte No	Name	Contents	Pulses	Time(used)
1	SYNC	006		
2	OPSTAT N	006	Bit 7 = 0: Scan N= Forward	
3	SCHLIN N	130	88	16.58
4	TRNERR N	003 263	947	178.46
5	TORPLS N	360 207	-3961	-746.45
6	SHSERR N-1	377 363	-13	-2.45
7	FHSERR N-1	000 014	12	2.26
8	SUMERR N-1	377 360 211	-3959	-746.07
9	SCNCTR	000 200		
10	SCHLIN N-1	250	-88	-16.58
11	TRNERR N-1	001 137	351	66.15
12	TORPLS N-1	357 237	-4201	-791.68
13	SHSERR N-2	000 036	30	5.65
14	FHSERR N-2	377 343	-29	-5.47
15	SUMERR N-2	377 357 227	-4201	-791.68
16	SCNTYM N-2	004 353 030	323328	60742.82
17	NSCANS	212	No.Scans = 138 (decimal)	

Scan N: 2 no. of words transferred = 182

Line Length, N-1: 001 317 343 377

Active Scan Time, N-1: 60743.19

Final Time, N: 60743.48

TELEMETRY

Byte No	Name	Contents	Pulses	Time(used)
1	SYNC	200		
2	OPSTAT N	306	Bit 7 = 1: Scan N= Reverse	
3	SCHLIN N	250	-88	-16.58

ORIGINAL PAGE IS
OF POOR QUALITY

6	7	TORPLS	N	357	224	-4204	-792.25
8	9	SHSERR	N-1	000	034	28	5.28
10	11	FHSERR	N-1	377	343	-29	-5.47
12	13	SUMERR	N-1	377	357	225	-4202
15	16	SCNCTR		000	201		
17	18	SCNLIN	N-1	130		88	16.58
18	19	TRNERR	N-1	003	263	947	178.45
20	21	TORPLS	N-1	360	207	-3961	-746.45
22	23	SHSERR	N-2	377	363	-13	-2.45
24	25	FHSERR	N-2	000	014	12	2.26
26	27	SUMERR	N-2	377	360	211	-3959
29	30	SCNTYM	N-2	004	353	032	322330
32	33	NSCANS		037			60743.20

No.Scans = 31 (decimal)

scan #: 38 no. of words transferred = 182

Line Length,N-1: 001 337 342 377
 Active Scan Time,N-1: 60743.19
 Final Time,N: 60742.92

TELEMETRY

Byte No	Name	Contents	Pulses	Time(usec)
1	SYNC	200		
2	OPSTAT	N	206	
3	SCNLIN	N	250	
4	5	TRNERR	N	001 137
6	7	TORPLS	N	357 223
8	9	SHSERR	N-1	000 035
10	11	FHSERR	N-1	377 342
12	13	SUMERR	N-1	377 357 225
15	16	SCNCTR		000 223
17	18	SCNLIN	N-1	130
18	19	TRNERR	N-1	003 264
20	21	TORPLS	N-1	360 207
22	23	SHSERR	N-2	377 362
24	25	FHSERR	N-2	000 013
26	27	SUMERR	N-2	377 360 212
29	30	SCNTYM	N-2	004 353 034
32	33	NSCANS		037

Bit 7 = 1: Scan N = Reverse
 No.Scans = 31 (decimal)

scan #: 39 no. of words transferred = 181

Line Length,N-1: 377 120 015 000
 Active Scan Time,N-1: 60742.62
 Final Time,N: 60743.11

TELEMETRY

Byte No	Name	Contents	Pulses	Time(usec)
1	SYNC	200		
2	OPSTAT	N	006	
3	SCNLIN	N	130	
4	5	TRNERR	N	003 262
6	7	TORPLS	N	360 212
8	9	SHSERR	N-1	377 365
10	11	FHSERR	N-1	000 015
12	13	SUMERR	N-1	377 360 211
15	16	SCNCTR		000 223
17	18	SCNLIN	N-1	250
18	19	TRNERR	N-1	001 137
20	21	TORPLS	N-1	357 223
22	23	SHSERR	N-2	000 035
24	25	FHSERR	N-2	377 342
26	27	SUMERR	N-2	377 357 225
29	30	SCNTYM	N-2	004 353 032
32	33	NSCANS		037

Bit 7 = 0: Scan N = Forward
 No.Scans = 31 (decimal)

ORIGINAL PAGE IS
OF POOR QUALITY

DATA SHEET 4.3.5-1
OPERATIONAL PERFORMANCE
SCAN TO SCAN REPEATABILITY

TS 32015-004
8 March 1980

SMA Designation F-1 ADEPT TEST

S/N: 4

SAN MODE

2

SME (1) or (2):

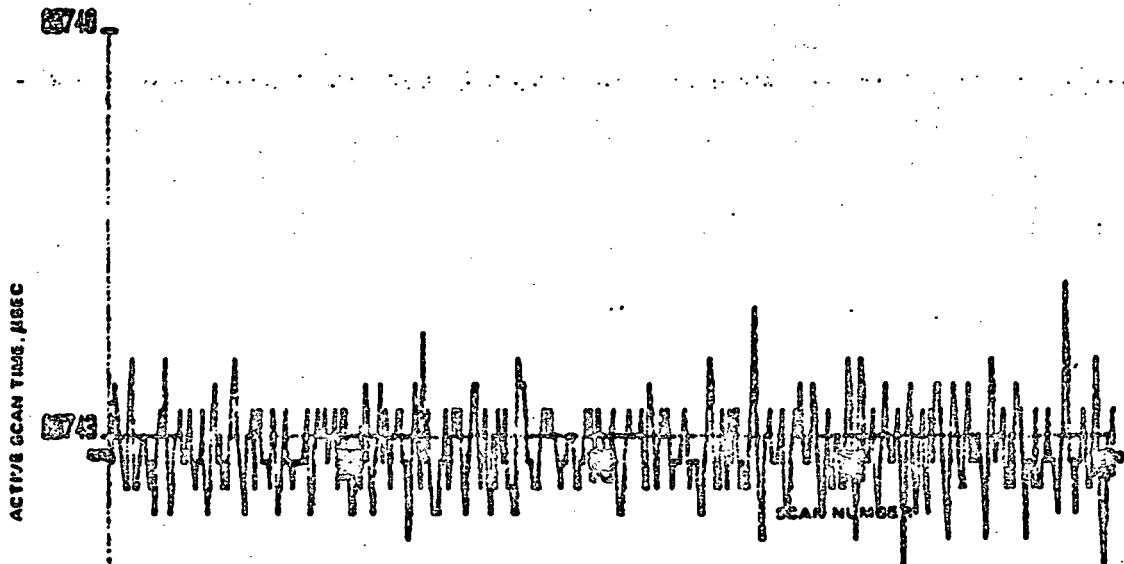
Voltage: High , Nom , Low

31.7 -31.6 0.3

400 CONSECUTIVE
(200 FWD, 200 REV)

200 FWD

200 REV



	CLOCK-CORRECTED LINE-LENGTH, μSEC					
	MEAN	SPEC	P/P	ONE-SIGMA	SPEC	P/P
FWD	172.1	174	P	1.1	0 TO 2.0	P
REV	172.1	174	P	1.2	0 TO 2.0	P

Run No. 3001.1513

Test Flow Event H-16 seq 6

Comments test no. 18

QC Stamp

Tested By

Date

3/6/81

ORIGINAL PAGE IS
OF POOR QUALITY

DATA SHEET 43.5-3
OPERATIONAL PERFORMANCE
SCAN PARAMETERS

TS 32015-004

Rev 2

attach to data sheet 4.3.5-2

400 scan parameter

121886

OPERATIONAL PERFORMANCE
SCAN PARAMETERS

SME Test Location: F-1 ACCEPT TEST

operation: SME(2) SAM

Serial Number: 4

Test Flow Event: N-16 Sea 6

Run Number: 30681.1519

Voltages: 30.7 -30.5 8.0

temperatures	T1	T2	T3	T4	T5	T6	T7	T8	T9
	(+Z)	(-Z)	(+X)	(-X)	(BRDG)	(SAM)	(SME)	(-Z-X)	(+Z+X)
deg C	29.8	28.5	28.9	29.5	29.1	30.1	34.5	28.3	28.1

SCAN PARAMETER (400 scans)	MEASURED	REQUIREMENT	SPECIFICATION	P/F
----------------------------	----------	-------------	---------------	-----

clock freq, HZ	10612841	10612875	+/-125	P
----------------	----------	----------	--------	---

torsion pulse width, usec				
---------------------------	--	--	--	--

mean	769	<1100		P
------	-----	-------	--	---

sigma	22			
-------	----	--	--	--

turn-around time, usec		10590	+/- 68	
------------------------	--	-------	--------	--

bumper A: mean	10650.6			P
----------------	---------	--	--	---

sigma	0.1			
-------	-----	--	--	--

bumper B: mean	10527.8			P
----------------	---------	--	--	---

sigma	0.2			
-------	-----	--	--	--

active scan time, usec				
------------------------	--	--	--	--

fwd: min	60742.1			
----------	---------	--	--	--

max	60743.6			
-----	---------	--	--	--

mean	60742.9			
------	---------	--	--	--

sigma	0.3			
-------	-----	--	--	--

rev: min	60742.2			
----------	---------	--	--	--

max	60744.1			
-----	---------	--	--	--

mean	60742.9			
------	---------	--	--	--

sigma	0.3			
-------	-----	--	--	--

combine: mean	60742.9		60743 +/-0.2	P
---------------	---------	--	--------------	---

sigma	0.3		<2.9	P
-------	-----	--	------	---

scan period, usec	142664.2	142666	+/-140	P
-------------------	----------	--------	--------	---

scan rate var, percent			+/-1	P
------------------------	--	--	------	---

fwd: min	-0.001			P
----------	--------	--	--	---

max	0.001			P
-----	-------	--	--	---

rev: min	-0.001			P
----------	--------	--	--	---

max	0.002			P
-----	-------	--	--	---

SAM offset(P0 mean), urad	0.06			
---------------------------	------	--	--	--

line start pulse angular				
--------------------------	--	--	--	--

jitter(P0 sigma), urad	0.14		<1.00	P
------------------------	------	--	-------	---

SAM angle, urad				
-----------------	--	--	--	--

fwd: mean	134588			
-----------	--------	--	--	--

sigma	0.73		<1	P
-------	------	--	----	---

rev: mean	134590			
-----------	--------	--	--	--

sigma	0.31		<1	P
-------	------	--	----	---

tested by

UN

NO. REQ'D = 22

1. *Phragmites* spp. (Poaceae)

Date: 030500 Time: 1519

INITIALIZE Words Transferred: 4

Bit	Description	Setting
0	Panel Mode	1
1	Calibrate Mode	0
2	Scan Mode	0

Bit	Description	Setting
0	Beeper SW On	0
1	Bee SAM P0/P3	1
2	Bee SAM P2/P5	0
3	Bee SAM PA/PB	0
4	Processed SAM	1
5	Raw SAM	0
6	SAM 1 or SAM 2	0
7	SAM 3 (CAL SAM)	0
8	Single Reset	0
9	End SAM P0/P3	0
10	End SAM P2/P5	1
11	End SAM PD/PE	0
12	Ext Reset	0
13	5 Facet	0
14	Calibrate Mode	0
15	Scan Mode	0
16	Initialize Mode	1
17	Slow Telemetry Mode	0

```
Number of Scans of S$ Dimension: 400
Dimension of S$ Array: 15226
Dimension of W$ Array: 800
```

Force	Defl. Coords	Preset Angles	No. of b's
1000	0.00000000	-0.71820000E-02	1.63620000E-05
2000	0.00000000	0.00000000E+00	0.44219333E-05
3000	0.00000000	0.71987000E-02	-0.40853140E-04

ORIGINAL PAGE 19
OF POOR QUALITY

Scanner A: 0.00
Scanner B: 0.00

Temperatures and Voltages

Ch	Scanner Out	Device	Cal	Measurement
0	-1.0000E 04	QUARTER	3	ERROR
1	2.2412E-02	EU=6.8I	5	2241.200 mAmps
2	1.4150E-03	EU=+27I	5	28.300 mAmps
3	-1.2480E-03	EU=-27I	5	24.960 mAmps
4	1.7538E 03	SMA -Z	1	28.542 Deg C
5	1.5394E 03	SMA -X	1	29.466 Deg C
6	1.6626E 03	SMA +Z	1	29.850 Deg C
7	1.7285E 03	SMA +X	1	28.905 Deg C
8	1.7130E 03	TORQ BRDG	1	29.128 Deg C
9	7.1225E 02	SME TEMP	2	34.507 Deg C
10	1.6455E 03	SAM TEMP	1	30.118 Deg C
11	7.9299E 00	EU=6.8V	4	7.990 Volts
12	8.5835E 03	MF(-Z-X)	3	28.258 Deg C
13	8.6048E 03	MF(+Z+X)	3	28.091 Deg C
14	4.3867E-01	SME(1)TEL	4	0.439 Volts
15	4.3468E 00	SME(2)TEL	4	4.347 Volts
16	-1.0000E 04	SME PR U7	3	ERROR
17	1.7869E-01	SAM1/BMP2	4	0.179 Volts
18	3.0681E 01	EU=+27V	4	30.681 Volts
19	-3.0561E 01	EU=-27V	4	-30.561 Volts

=====

ERROR 60 OCCURS DURING MARKING OF TAPE:

Type: to REMARK---press execute---press continue

=====

Data Tape Identifier: FID7

Track for Data: 1

Init Col Data File Number: 11

Scan Data File Number: 12

-C-4

ORIGINAL PAGE IS
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DATA SHEET 4.3.8-1
OPERATIONAL PERFORMANCE
SCAN TO SCAN REPEATABILITY

TS 32015-004
8 March 1980

SMA Designation: 1 ACCEPT TEST

S/N: 4 ELPER MODE 2
SME (1) or (2):

Voltage: High ✓, Nom , Low

32.7 -32.8 2.0

400 CONSECUTIVE
(200 FWD, 200 REV)

200 FWD

200 REV

ACTIVE SCAN TIME, μ SEC

71343

71339

	CLOCK-CORRECTED LINE LENGTH, μ SEC					
	MEAN	SPC	P/P	ONE-SIGMA	SPC	P/P
FWD	7132.07	7133 +1	P	1.70	STD 2.5	P
REV	7132.00	7133 +1	P	1.57	STD 2.0	P

Run No. 32531.1529

Test Flow Event N-18 seq 8

Comments test no. 18

QC Stamp

Date

3/6/81

Tested By

TS 12015-004

DATA SHEET 4263
OPERATIONAL PERFORMANCE
SCAN PARAMETERS

attach to data sheet 4.3.5-2 400scan parameter, topeht, rev121880

OPERATIONAL PERFORMANCE
SCAN PARAMETERS

SMA Designation: F-1 ACCEPT TEST
Serial Number: 4
Run Number: 30681.1529
temperatures T1 T2 T3 T4 T5 T6 T7 T8 T9
(+2) 29.9 28.6 28.9 29.5 29.2 30.2 34.7 28.3 28.1
(-2) (-2) (-X) (-X) (BRDG) (SME) (-2-X) (+2+X)
deg C

SCAN PARAMETER (400 scans) MEASURED REQUIREMENT SPECIFICATION P/F

clock freq, HZ 10612842 10612875 +-125 P

torque pulse width, usec
mean 857
sigma 40 P

bumper to bumper time, usec

fwd: min 71340.9
max 71346.5
mean 71342.9
sigma 1.0

rev: min 71340.5
max 71345.0
mean 71342.9
sigma 0.8

combined mean 71342.9
sigma 0.9

scan period, usec 142685.8 142686 +-1.6

scan rate var, percent

fwd: min -0.003
max 0.005
rev: min -0.003
max 0.003

71343 +-0.8
<2.9 P P P

Tested by

QA

NO. REQ'D = 22

100-443887-100

Ch	Span	Device	Cal	Measurement
4	1.7500E 03	SMU - E	1	28.533 Deg C
12	8.5000E 00	MF1 - (2+X)	3	28.278 Deg C
13	8.5000E 03	MF1 - (2+X)	3	28.101 Deg C

DATE: 08/01/2011 TIME: 15:29

```
SNR Description: F-1 ACCEPT TEST
Serial Number: 4
Run Number: 30681.1529
Test Flow Event: N
Test Number: 18
Sequence Number: 5
Procedure: 9.00E-01 TORR
```

ORIGINAL PAGE IS
OF POOR QUALITY

INITIALIZE Words Transferred: 4

Word Number 8: INTERRUPT (Row 177771 Octal)

Bit	Description	Setting
0	Panel Mode	1
1	Calibrate Mode	0
2	Scan Mode	0

Unit Number : PANEL STATUS (Row 040402 Octal)

Bit	Description	Setting
0	Bumper SW On	0
1	Bee SAM P0/P3	1
2	Bee SAM P2/P5	0
3	Bee SAM PA/PB	0
4,5	Processed SAM	1
4,5	Raw SAM	0
4,5	SAM 1 or SAM 2	0
4,5	SAM 3 (CAL SAM)	0
6	Single Reset	0
7	End SAM P0/P3	0
8	End SAM P2/P5	1
9	End SAM PD/PE	0
10	Ext. Reset	0
11	5 Facet	0
12	Calibrate Mode	0
13	Scan Mode	0
14	Initialize Mode	1
15	Slow Telemetry Mode	0

```

Word Numbers 2 and 3:          (Raw 000000 007157 Octal)
Scan Count Preset:             7157 Octal      No. of Scans:          400
Time Count Preset:             00000000        No. of Samples:         0

```

```
Number of Scans of S$ Dimension: 400
Dimension of S$ Array: 15226
Dimension of N$ Array: 800
```

CALIBRATE: SAM/SME: 2

Face	IRF Count	Preset Angle	No. orb
P0P5	0.00	-5.7182000E-02	1.6392000E 05
P1P4	1.9220.00	0.0000000E 00	3.4421800E 06
P2P3	31.541.00	5.7195100E-02	-3.4095374E 04

ORIGINAL PAGE IS
OF POOR QUALITY

R = 0.500000

Bumper A: 0.00
Bumper B: 0.00

Temperatures and Voltages

Ch	Scanner Out	Device	Cal	Measurement
0	-1.0000E 04	QUARTER	3	ERROR
1	2.2496E-02	EU=6.8I	5	2249.600 mAmps
2	1.4550E-03	EU=+27I	5	29.300 mAmps
3	-1.2810E-03	EU=-27I	5	25.620 mAmps
4	1.7513E 03	SMA -Z	1	28.578 Deg C
5	1.5883E 03	SMA -X	1	29.482 Deg C
6	1.6621E 03	SMA +Z	1	29.857 Deg C
7	1.7269E 03	SMA +X	1	28.928 Deg C
8	1.7193E 03	TORQ BRDG	1	29.167 Deg C
9	7.0693E 02	SME TEMP	2	34.717 Deg C
10	1.6417E 03	SAM TEMP	1	30.187 Deg C
11	7.9896E 00	EU=6.8V	4	7.990 Volts
12	8.5787E 03	MF(-Z-X)	3	28.296 Deg C
13	8.5992E 03	MF(+Z-X)	3	28.135 Deg C
14	2.4984E-01	SME(1)TEL	4	0.250 Volts
15	4.3469E 00	SME(2)TEL	4	4.347 Volts
16	-1.0000E 04	SME PR U7	3	ERROR
17	3.8903E 00	SAM1/BMP2	4	3.890 Volts
18	3.0681E 01	EU=+27V	4	30.681 Volts
19	-3.0562E 01	EU=-27V	4	-30.562 Volts

=====

IF 'ERROR 60' OCCURS DURING MARKING OF TAPE:

type:to REMARK---press execute--press continue

=====

Data Tape Identifier: F1D7

Track for Data: 1

Init/Cal Data File Number: 13

Scan Data File Number: 14

ORIGINAL PAGE IS
OF POOR QUALITY

DATA SHEET 4.3.6-3
OPERATIONAL PERFORMANCE
ALONG SCAN GEOMETRIC REPEATABILITY

TS 32015-004
8 March 1980

SMA Designation F-1 ACCEPT TEST 9/N4

SIN WAVE (and calibrated)
SWE (1) or (2) 2

Voltage: High ☒ , Nom ☐ , Low ☐

IPAR COUNTS:

CALIBRATION

BUMPER A

P2 P3

MID-PT P4

P5 P6

BUMPER B

SCANNING

SAM OFFSETS, μ RAD

MEAN VALUES
P2 23 P3 -1.6
P1 25 P4 -1.2
P6 19 P5 -1.2
28 LAST P6 L7

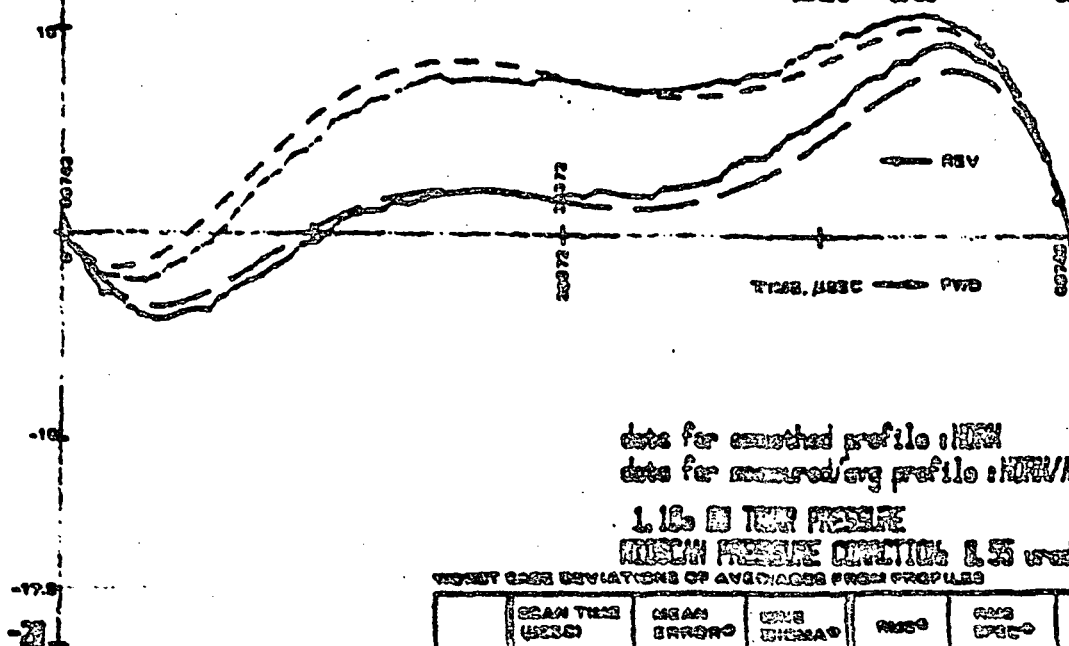
TEMP: T1 T2 T3 T4 T5 T6 T7 T8
31.9 21.7 21.8 21.6 21.3 21.3 21.8 21.4 21.2
SAM ANGLES
USED (MRAO) -5.102 5.102

PWD SMOOTHED PROFILE

TPROM TYPICAL RUN NO. 1
REV SMOOTHED PROFILE
MEASURED AVE, PWD
MEASURED AVG, REV

FWD REV
MIDSCAN OFFSET ANGLES, μ IN, μ IN
SLOPE 1.70 0.03
SLOPE 0.02 0.03
MIDSCAN GROUND CORRECTION
SLOPE -1.23 0.14

NON-LEAKAGE, μ RAD



data for smoothed profile: NORM
data for measured/avg profile: NORM/AVG

1.15 IN TEST PRESSURE
MIDSCAN PRESSURE CORRECTION 0.55 used

VELOCITY DEVIATIONS OF AVERAGES FROM PROFILES

	SCAN TIME (μSEC)	MEAN ERROR	MAX ERROR	RMS	RMS SPEC	P/P
PWD	48822.47	1.11	1.44	1.10		
REV	32374.03	-1.02	0.23	1.00	0.170	P

0 MICRORADIANS

Run No. 32015.153

Test Flow Event 7-23 seq 8

Comments test no. 28.19 FWD/REV SCAN 75% seq

QA Stamp

Date

Tested By

NO. REC'D - 22
VOLUME

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TS 32015-004
8 March 1980

DATA SHEET 4.3.5-3
OPERATIONAL PERFORMANCE
ALONG SCAN GEOMETRIC REPEATABILITY

SP-1 Designation F-1 ACCEPT TEST 8/4

SAN MODE (and calibrated deviation profile)
SLE (1) or (2) 2 Vchapt: High Low

IFAN COUNTS:
CALIBRATION

BUMPER A
P2 P3

MID - P1 P4
P3 P6

BUMPER B
P2 P3

SCANNING

MEAN VALUES

5

12.5

10

-10

-17.5

-5

12.5

10

-10

-17.5

-5

12.5

10

-10

-17.5

-5

12.5

10

-10

-17.5

-5

12.5

10

-10

-17.5

-5

12.5

10

-10

-17.5

-5

12.5

10

349

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1.28875

TEMP: T1

T2

T3

T4

T5

31.0

22.7

22.0

22.0

22.3

22.3

22.3

22.4

SAN ANGLES
USED (M/RAD)

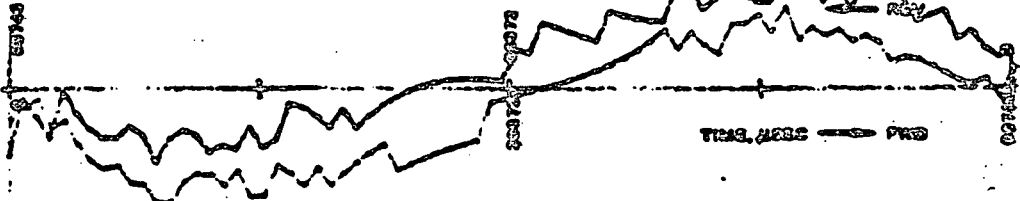
-57.102

57.102

PRO SMOOTHED PROFILE
(FROM TFS-4 RUN NO. 15216)
REV SMOOTHED PROFILE
MEASURED AVG, PRO
MEASURED AVG, REV

PRO REV
MIDSCAN OFFSET ANGLES, PRO, REV
MIDSCAN CORRECTION
MIDSCAN CORRECTION

NON-LEASABILITY, /RAD



data for smoothed profile : NEW
data for measured/avg profile : NEW/AVG

1.12 is TWR PRESSURE
MIDSCAN PRESSURE CORRECTION 1.5 used

WORST CASE DEVIATIONS OF AVERAGES FROM PROFILES

	SCAN TIME (MSEC)	MEAN ERROR	ONE SIGMA	RMS	RMS P/P	P/P
PRO	15216.47	1.11	1.44	1.19		
REV	15216.23	-1.12	1.33	1.19	61.73	P

° MICRORADIANS

Run No. 30081.1559

Test Flow Event N-23 seq 8

Comments test on 28 19 EMD/19 REV SCAN 75pts each

QA Stamp



Date 30081

Tested By

ORIGINAL PAGE IS
OF POOR QUALITY

DATA SHEET 4.3.5-4
OPERATIONAL PERFORMANCE
CROSS SCAN REPEATABILITY

TS 32015-004
8 March 1980

SMA Designation F-1 ACCEPT TEST S/N 4 SAN 1000 (1) or (2) 2

Voltage: High , Nom , Low

217 -218 2.0

FORWARD LINEAR (PAR-ALIGNMENT
TERM REMOVED):

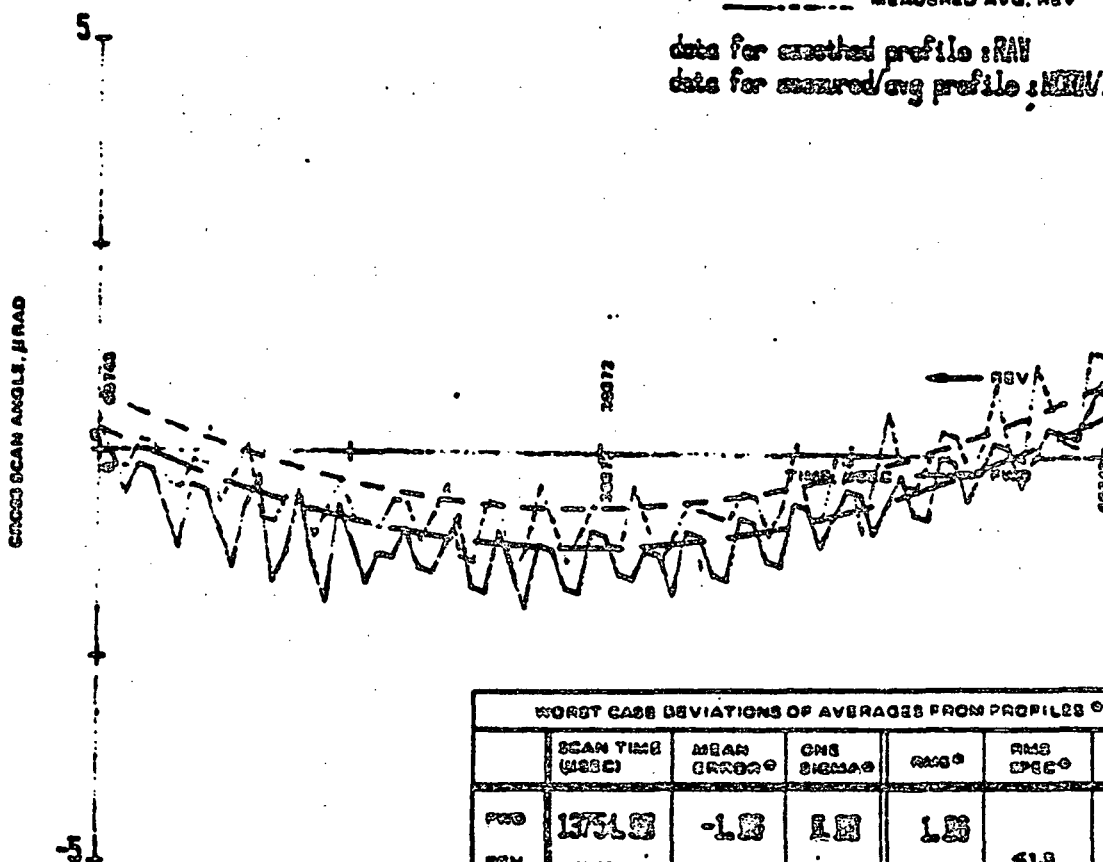
91.53 used

(FROM TPE-P RUN NO.

____ PWD SMOOTHED PROFILE
____ (FROM TPE-P RUN NO.)
____ REV SMOOTHED PROFILE
____ MEASURED AVG. PWD
____ MEASURED AVG. REV

data for smoothed profile : RAW

data for measured/avg profile : MEAS/AVG



WORST CASE DEVIATIONS OF AVERAGES FROM PROFILES 00						
	SCAN TIME (μSEC)	MEAN ERROR	CMS SIGMA	RMS	RMS SPEC	P/P
PWD	13751.0	-1.0	1.0	1.0		P
REV	47737.5	-1.0	1.0	1.0	<1.0	

PRELIMINARY

1.12.0

0 MICRORADIANS
00 AFTER REMOVING THE LINEAR
IFAR-ALIGNMENT TERM THAT WAS REMOVED
FROM THE ORIGINAL PROFILE

Run No. 3301.1559

Test Flow Event H-21 eq 6

Comments test no. 23

QA Stamp Date 3001

Tested By

ORIGINAL PAGE IS
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1. 00147-FR, 110, 0, file 4, rev 032781

===== TEST INITIAL CONDITIONS =====

- 1) Pans must be dry for at least 20 min.
- 2) 110 heaters must be on at least 45 min
- 3) 110 temp (+Z-X) must be +/- 1 deg from (-Z-X)
- 4) Chamber pressure must be less than 2 torr
- 5) Cross axis polarity correct

=====

Temperatures and Voltages

Ch	Scanner Out	Device	Cal	Measurement
4	1.7434E 03	SMA -Z	1	28.620 Deg C
12	8.5675E 03	MF(-Z-X)	3	28.384 Deg C
13	8.5809E 03	MF(+Z+X)	3	28.279 Deg C

Date: 030681 Time: 1559

SMA Designation: F-1 ACCEPT TEST
 Serial Number: 4
 Run Number: 30681.1559
 Test Flow Event: N
 Test Number: 20
 Sequence Number: 6

INITIALIZE Words Transferred: 4

Word Number 0: INTERRUPT (Raw 177771 Octal)

Bit	Description	Setting
0	Panel Mode	1
1	Calibrate Mode	0
2	Scan Mode	0

Word Number 1: PANEL STATUS (Raw 046402 Octal)

Bit	Description	Setting
0	Bumper SW On	0
1	See SAM P0/P3	1
2	See SAM P2/P5	0
3	See SAM PA/PB	0
4	Processed SAM	1
45	Raw SAM	0
45	SAM 1 or SAM 2	0
45	SAM 3 (CAL SAM)	0
6	Single Reset	0
7	End SAM P0/P3	0
8	End SAM P2/P5	1
9	End SAM PD/PE	0
10	Ext Reset	1
11	5 Facet	1
12	Calibrate Mode	0
13	Scan Mode	0
14	Initialize Mode	1
15	Slow Telemetry Mode	0

Word Numbers 2 and 3: (Raw 176747 057730 Octal)

Scan Count Preset:	7730 Octal	No. of Scans:	39
Time Count Preset:	3757165	No. of Samples:	75

Number of Scans of S₂ Dimension: 41
 Scans of S₂ Dimension: 3075
 Number of Samples plus 1: 76
 Total Samples: 1155

-----P25

Copy Date : 4/22

-----BUMPER B-----

-----S1F2-----

-----BUMPER A-----

-----P2P3-----

-----P0P5-----

A one Scan Calibration
Time at end of Cal:1603.15

K = 0.500075

```

+POSS SCAN conversion factor:      0.409urad/IFAR count
+POSS AXIS THERM DRIFT RATE: 0.07urad/min
+POSS SCAN linear term desired: 97.68urad

```

[illegible]

Throat Pressure (mm): 1.10

Ch	Scanner Out	Device	Cal	Measurement
0	-1.0030E 04	QUARTER	3	ERROR
1	2.0511E-02	EU=6.8I	5	2051.600 mAmps
2	1.4410E-03	EU=+27I	5	28.820 mAmps
3	-1.3250E-03	EU=-27I	5	24.500 mAmps
4	1.7449E 03	SMA -Z	1	28.671 Deg C
5	1.6809E 03	SMA -X	1	29.587 Deg C
6	1.6541E 03	SMA +Z	1	29.971 Deg C
7	1.7196E 03	SMA +X	1	29.032 Deg C
8	1.7023E 03	TORQ BRDG	1	29.280 Deg C
9	6.9969E 02	SME TEMP	2	35.002 Deg C
10	1.6328E 03	SAM TEMP	1	30.345 Deg C
11	7.9910E 00	EU=6.8V	4	7.991 volts
12	8.5638E 03	NF(-Z-X)	3	28.413 Deg C
13	3.5064E 03	NF(+Z+X)	3	28.235 Deg C
14	4.3737E-01	SME(1)TEL	4	0.437 Volts
15	4.3470E 00	SME(2)TEL	4	4.347 Volts
16	-1.0000E 04	SME PR U7	3	ERROR
17	1.7881E-01	SAM1/BMP2	4	0.179 Volts
18	3.0682E 01	EU=+27V	4	30.682 Volts
19	-3.0582E 01	EU=-27V	4	-30.562 Volts

```

Data Tape Identifier:      FID3
Track for Data:            0
Init/Cal Data File Number: 4
Scan Data File Number:    5
Norm/Rng Scan Data File Number: 6

```

IF 'ERROR' IS OCCURS DURING MARKING OF TAPE:
 * RE-LOAD TAPES - RE-EJECT & RE-LOAD CONTINUES

File: 000001 Time: 1559

ORIGINAL PAGE 13
OF POOR QUALITY

Date: 000001 Time: 1559

File Name: F-1 ACCEPT TEST

File Number: 4

File Number: 00001.1559

Test From File: N

Test Number: 20

Test Date: 1559

File Name: F1DE

File Number: 0

In T/CAL data file number: 4

SCAN data file number: 5

NORM AVG SCAN data file number: 6

Machine Control file number: 0

Mode selected: NORM AVG

TELEMETRY PRINTOUT: 2: tape AT-F, trk 0, file 16, rev 22381

Date: 000001 Data Time: 1559

BAK MODE operation

Line No: 1 no. of words transferred = 187

Line Length: N-1: 377 120 013 000

Active Scan Time: N-1: 60743.00

Inal Time: N: 60743.48

TELEMETRY

Byte No	Name	Contents	Pulses	Time(μsec)
1	SYNO	006		
2	OPSTAT N	106	Bit 7 = 0: Scan N= Forward	
3	SONLIN N	130	88	16.58
4	5 TRNERR N	003 361	1009	190.15
6	7 TORPLS N	360 227	-3945	-743.44
8	9 SHSERR N-1	377 365	-11	-2.07
10	11 FHSERR N-1	000 013	11	2.07
12	13 14 SUMERR N-1	377 360 227	-3945	-743.44
15	16 SONCTR	000 230		
17	SONLIN N-1	250	-88	-16.58
18	19 TRNERR N-1	001 160	368	69.35
20	21 TORPLS N-1	357 246	-4186	-788.85
22	23 SHSERR N-2	000 026	22	4.15
24	25 FHSERR N-2	377 353	-21	-3.96
26	27 28 SUMERR N-2	377 357 246	-4186	-788.85
29	30 31 SONTYN N-2	004 353 030	323328	60742.92
32	NSCANB	054	No.Scans =	44 (decimal)

scan N: 2 no. of words transferred = 182

Line Length: N-1: 001 137 352 377

Active Scan Time: N-1: 60743.19

Inal Time: N: 60743.11

TELEMETRY

Byte No	Name	Contents	Pulses	Time(μsec)
1	SYNO	246		
2	OPSTAT N	306	Bit 7 = 1: Scan N= Reverse	
3	SONLIN N	150	-88	-16.58
4	5 TRNERR N	001 160	368	69.35

ORIGINAL PAGE IS
OF POOR QUALITY

12	13	14	TRNERR	N-1	003	361	246	-4196	-788.85
15	16	SONCTR			000	231			
17	18	SONLIN	N-1		130		88	16.58	
19	20	TRNERR	N-1		003	361	1009	190.15	
20	21	TORPLS	N-1		360	227	-3945	-743.44	
22	23	SHSERR	N-2		377	365	-11	-2.07	
24	25	FHSERR	N-2		000	013	11	2.07	
26	27	SUMERR	N-2		377	360	227	-3945	-743.44
29	30	SONTYM	N-2		004	353	031	322329	60743.01
32		NSCANS			037				

No.Scans = 31 (decimal)

scan N: 38 no. of words transferred = 182

Line Length,N-1: 001 137 352 377
 Active Scan Time,N-1: 60743.19
 Final Time,N: 60742.92

TELEMETRY

Byte No	Name	Contents	Pulses	Time(us)
1	SYNC	246		
2	OPSTAT	N 306		
3	SONLIN	N 250	Bit 7 = 1: Scan N= Reverse	-80 -16.58
4	TRNERR	N 001 161	369	69.54
5	TORPLS	N 357 242	-4190	-789.61
8	SHSERR	N-1 000 025	21	3.96
10	FHSERR	N-1 377 352	-22	-4.15
12	SUMERR	N-1 377 357 244	-4188	-789.23
15	SONCTR	000 253		
17	SONLIN	N-1 130	88	16.58
18	TRNERR	N-1 003 361	1009	190.15
20	TORPLS	N-1 360 225	-3947	-743.81
22	SHSERR	N-2 377 365	-11	-2.07
24	FHSERR	N-2 000 013	11	2.07
26	SUMERR	N-2 377 360 225	-3947	-743.81
29	SONTYM	N-2 004 353 031	322329	60743.01
32	NSCANS	037	No.Scans =	31 (decimal)

scan N: 39 no. of words transferred = 181

Line Length,N-1: 377 140 014 000
 Active Scan Time,N-1: 60742.62
 Final Time,N: 60743.11

TELEMETRY

Byte No	Name	Contents	Pulses	Time(us)
1	SYNC	246		
2	OPSTAT	N 106		
3	SONLIN	N 130	88	16.58
4	TRNERR	N 003 361	1009	190.15
5	TORPLS	N 360 225	-3947	-743.31
8	SHSERR	N-1 377 366	-10	-1.88
10	FHSERR	N-1 000 014	12	2.26
12	SUMERR	N-1 377 360 224	-3948	-744.00
15	SONCTR	000 253		
17	SONLIN	N-1 250	-88	-16.58
18	TRNERR	N-1 001 161	369	69.54
20	TORPLS	N-1 357 242	-4190	-789.61
22	SHSERR	N-2 000 025	21	3.96
24	FHSERR	N-2 377 352	-22	-4.15
26	SUMERR	N-2 377 357 244	-4188	-789.23
29	SONTYM	N-2 004 353 032	322330	60743.20
32	NSCANS	037	No.Scans =	31 (decimal)

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Appendix B

Scan Mirror Assembly Acceptance Test Data

Part 17

Test Flow Event R

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DATA SHEET 4.3.7-1
OPERABILITY CHECKS
AUTOMATIC TESTS

TS 32015-004

287

ATTACH TO DATA SHEET 4.3.7-1 OPERABILITY CHECKS -- AUTOMATIC CHECKS
QTC----

attach to data sheet 4.3.7-1 operability check, 21tapeAT-FM, trk9, file2, reel21800

OPERABILITY CHECK
AUTOMATIC CHECK

SMA Designation: F-1 ACCEPT TEST
Serial Number: 4
Run Number: 30981.1527
Operation: SME(1) SAM
Test Flow Event: R-1
Sequence Number: 6

TEMPERATURES
deg C
T1 (+2) 26.6
T2 (-2) 25.2
T3 (+X) 25.9
T4 (-X) 26.4
T5 (BRDG) (SAM) 27.3
T6 (SME) 30.8
T7 (-2-X) 24.2
T8 (+2+X) 24.2
T9

SMA POWER SUPPLIES
+27
-27
-6.8
measured
HOM
28.9
-28.8
7.1
supply rms
volts
28 to 30
-28 to -30
6.3 to 7.7
measured
mamps
27.5
26.3
1974.7
spec
mamps
200
200
2500
P/F
P
P
P

BILEVEL DIGITAL
TELEMETRY, volts
SME(1) ON 4.3
SME(2) ON 0.2
SAM(1)/BUMPER(2) 3.9

MODE
SME(1), SAM

PRESSURE, torr
1.0
req'd <= 2

TORQUE PULSES, usec
(100 scans) TAU A
TAU B
mean
781.5
753.0
sigma
0.3
0.3
req'd
600 to 1000
600 to 1000
P
P

ACTIVE SCAN TIME, usec
(100 scans)
combined
mean
60742.9
req'd
60742.8
to 60743.2
sigma
0.4
req'd
2.9
P
P

TURN-ON TIME, sec
(time to reach within 10usec of active scan time)
9.2
spec <= 60
P

66-00100

Tested by

Data No. = 30981.1527 Date Time: 1527

ORIGINAL PAGE IS
OF POOR QUALITY

IMA Parameters: F-1 ACCEPT TEST
 Serial Number: 4
 Run Number: 30981.1527
 Test Flow Event: R
 Sequence Number: 6

SAM MODE operation

scan N: 99 no. of words transferred = 32

Line Length, N-1: 377 160 006 000
 Active Scan Time, N-1: 60743.57
 Final Time, N: 60743.48

TELEMETRY

Byte No	Name	Contents	Pulses	Time(used)
1	SYNC	200		
2	OPSTAT N	006	Bit 7 = 0: Scan N= Forward	
3	SCN LIN N	130	88	16.58
4 5	TRNERR N	004 012	1034	194.86
6 7	TORPLS N	360 142	-3998	-753.42
8 9	SHSERR N-1	377 367	-9	-1.70
10 11	FHSERR N-1	000 006	6	1.13
12 13 14	SUMERR N-1	377 360 145	-3995	-752.86
15 16	SCNCTR	003 304		
17	SCN LIN N-1	250	-88	-16.58
18 19	TRNERR N-1	001 000	256	48.24
20 21	TORPLS N-1	357 316	-4146	-781.32
22 23	SHSERR N-2	000 022	18	3.39
24 25	FHSERR N-2	377 356	-18	-3.39
26 27 28	SUMERR N-2	377 357 316	-4146	-781.32
29 30 31	SCNTYM N-2	004 353 031	322329	60743.01
32	NSCANS	037	No.Scans =	31 (decimal)

scan N:100 no. of words transferred = 31

Line Length, N-1: 001 057 355 377
 Active Scan Time, N-1: 60743.19
 Final Time, N: 60742.73

TELEMETRY

Byte No	Name	Contents	Pulses	Time(used)
1	SYNC	200		
2	OPSTAT N	206	Bit 7 = 1: Scan N= Reverse	
3	SCN LIN N	250	-88	-16.58
4 5	TRNERR N	001 000	256	48.24
6 7	TORPLS N	357 312	-4150	-782.07
8 9	SHSERR N-1	000 022	18	3.39
10 11	FHSERR N-1	377 355	-19	-3.58
12 13 14	SUMERR N-1	377 357 314	-4148	-781.69
15 16	SCNCTR	003 304		
17	SCN LIN N-1	130	88	16.58
18 19	TRNERR N-1	004 012	1034	194.86
20 21	TORPLS N-1	360 142	-3998	-753.42
22 23	SHSERR N-2	377 367	-9	-1.70
24 25	FHSERR N-2	000 006	6	1.13
26 27 28	SUMERR N-2	377 360 145	-3995	-752.86
29 30 31	SCNTYM N-2	004 353 034	322332	60743.58
32	NSCANS	037	No.Scans =	31 (decimal)

ORIGINAL PAGE IS
OF POOR QUALITY

TS 32013-0001
Rev. B

DATA SHEET 4.3.7-2: OPERABILITY CHECKS

Manual Tests

SMA Designation F-1 S/N 4 SWE(1) (M) ✓ SWE(2) (M)

Step

(a)

MAX Pulse Interfaces

Place check in blocks indicated after observing the waveform (see Figure 4.3-12). The signal low should be 40 ± 40 m volts, and the signal high should be 600 ± 40 mv. The pulse duration should be from 300 psec to 400 psec. (For Pseudo SANS just confirm their presence with a check)

SIGNAL	SWITCH POSITION	NORM	SWITCH POSITION	COMPLEMENT	PSEUDO (45/46sec)
Pulses	3 or 7	✓	4 or 8	✓	✓
Direction	1 or 5	✓	2 or 6	✓	✓

(b)

"SWE 1 ON MAX":

Logic 1

Logic 0

IF SWE (1) is ON (✓)

4.5 to 5.5 volts

IF SWE (2) is ON (✓)

0 to 0.8 volts Pass Fail

Date 3/9/87 RA Stamp

Test Flow Event R Tested by B

Comments

No. Req'd = 20

ORIGINAL PAGE IS
OF POOR QUALITY

DATA SHEET 4.3.7-1
OPERABILITY CHECKS
AUTOMATIC TESTS

TS 32015-004

25-0

ATTACH TO DATA SHEET 4.3.7-1 OPERABILITY CHECK - AUTOMATIC CHECKS

attach to data sheet 4.3.7-1 operability check, 2; tape RT-FM, trk 0, file 2, rev 121800

OPERABILITY CHECK
AUTOMATIC CHECK

SMA Designation: F-1 ACCEPT TEST
Serial Number: 4
Run Number: 30981.1533
Operation: SME(1) BUMPER
Test Flow Event: R-3
Sequence Number: 6

TEMPERATURES
deg C
T1 (+2) 26.5
T2 (-2) 25.1
T3 (+X) 25.8
T4 (-X) 26.4
T5 (BRDG) (SAM) 26.4
T6 (SME) 27.3
T7 (-2-X) 30.7
T8 (-2-X) 24.2
T9 (+2-X) 24.2

SMA POWER SUPPLIES
measured
HOM
+27 28.9
-27 -28.8
-6.8 7.1
supply rms
volts
28 to 30
-28 to -30
6.3 to 7.7
measured
mamps
28.3
27.0
2260.4
spec
mamps
200
200
2500
P/F
P
P
P

BILEVEL DIGITAL
TELEMETRY, volts
SME(1) ON 4.3
SME(2) ON 0.4
SAM(1) BUMPER(2) 0.2

MODE
SME(1) BUMPER

PRESSURE, torr
1.0
req'd <= 2

TORQUE PULSES, usec
(100 scans) TAU A 837.0
TAU B 871.5
mean
sigma
0.9
0.9
req'd

BUMPER-BUMPER TIME, usec combined
(100 scans)
mean
71342.9
sigma
71342.2
71343.8
0.7
2.9
req'd
P
P

TURB-ON TIME, sec
(time to reach within 10 usec of active scan time)
7.9
spec <= 60
P

Tested by

QA Stamp

Stamp

Date: 010811 1531

ORIGINAL PAGE IS
OF POOR QUALITY

SM Designation: F-1 ACCEPT TEST

Serial Number: 4

Run Number: 30981.1533

Test Flow Event: R

Sequence Number: 6

BUMPER MODE operation

scan N: 99 no. of words transferred = 32

Line Length, N-1: 005 306 313 000

Bumper to Bumper Time, N-1: 71341.9

Final Time, N: 60743.11

TELEMETRY

Byte No	Name	Contents	Pulses	Time(us)
1	SYNC	200		
2	OPSTAT N	046	Bit 7 = 0: Scan N = Forward	
3	SCNLIN N	130	-88	16.58
4 5	TRNERR N	000 000	0	0.00
6 7	TORPLS N	355 362	-4622	-871.02
8 9	SHSERR N-1	000 000	0	0.00
10 11	FHSERR N-1	000 000	0	0.00
13 14	SUMERR N-1	377 355 356	-4626	-871.77
15 16	SCNCTR	003 172		
17	SCNLIN N-1	250	-88	-16.58
18 19	TRNERR N-1	000 000	0	0.00
20 21	TORPLS N-1	355 243	-4445	-837.66
22 23	SHSERR N-2	000 000	0	0.00
24 25	FHSERR N-2	000 000	0	0.00
27 28	SUMERR N-2	377 356 246	-4442	-837.10
30 31	SCNTYM N-2	004 353 034	322332	60743.58
32	NSCANS	037	No.Scans =	31 (decimal)

in N:100 no. of words transferred = 31

Line Length, N-1: 005 306 325 377

Bumper to Bumper Time, N-1: 71343.7

Final Time, N: 60743.11

TELEMETRY

Byte No	Name	Contents	Pulses	Time(us)
1	SYNC	200		
2	OPSTAT N	246	Bit 7 = 1: Scan N = Reverse	
3	SCNLIN N	250	-88	-16.58
4 5	TRNERR N	000 000	0	0.00
6 7	TORPLS N	356 246	-4442	-837.10
8 9	SHSERR N-1	000 000	0	0.00
10 11	FHSERR N-1	000 000	0	0.00
13 14	SUMERR N-1	377 356 251	-4439	-836.53
15 16	SCNCTR	003 172		
17	SCNLIN N-1	130	88	16.58
18 19	TRNERR N-1	000 000	0	0.00
20 21	TORPLS N-1	355 362	-4622	-871.02
22 23	SHSERR N-2	000 000	0	0.00
24 25	FHSERR N-2	000 000	0	0.00
27 28	SUMERR N-2	377 355 356	-4626	-871.77
30 31	SCNTYM N-2	004 353 023	322323	60741.88
32	NSCANS	037	No.Scans =	31 (decimal)

ORIGINAL PAGE IS
OF POOR QUALITY

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TS 32015-0044
EW.8

DATA SHEET 4.3.7-2: OPERABILITY CHECKS

Manual Tests

SMA Designation F-1 S/N 4 SHE(1) (✓) SHE(2) (✓)

Step

Bapt

(a)

MUX Pulse Interfaces

Place check in blocks indicated after observing the waveform (see Figure 4.3-12). The signal low should be 40 ± 40 m volts, and the signal high should be 600 ± 40 mV. The pulse duration should be from 300 μ sec to 400 μ sec. (For Pseudo SAMS just confirm their presence with a check)

SIGNAL	SWITCH POSITION	NOT	SWITCH POSITION	COMPLEMENT	PSEUDO (40 μ sec) ^(✓)
Pulses	3 or 7	✓	4 or 8	✓	✓
Direction	1 or 5	✓	2 or 6	✓	✓

(b)

"SHE 1 ON MUX":

IF SHE (1) is ON (✓)

IF SHE (2) is ON (✓)

Logic 1

4.5 to 5.5 volts

Logic 0

0 to 0.8 volt Pass Fail

Date 3/9/81 QA Stamp 

Test File: Event R Tested by F

Comments _____

No. Req'd = 20

ORIGINAL PAGE IS
OF POOR QUALITY

DATA SHEET 4.3.7-1
OPERABILITY CHECKS
AUTOMATIC TESTS

TS 32013-004

293

ATTACH TO DATA SHEET 4.3.7-1 OPERABILITY CHECKS - AS REMATED EXHIBIT

attach to data sheet 4.3.7-1 operability check, 2 tape A1-FM, trk 0, file 2, rev 121880

OPERABILITY CHECK
AUTOMATIC CHECK

SMA Designation: F-1 ACCEPT TEST
Serial Number: 4
Run Number: 30981.1540
Operation: SHE(2) SAM
Test Flow Event: R-5
Sequence Number: 6

TEMPERATURES
T1 (+2) 26.4
T2 (-2) 25.1
T3 (+X) 25.8
T4 (-X) 26.3
T5 (BRDG) (SAM) 26.4
T6 (SHE) 27.2
T7 (SHE) 30.5
T8 (-2-X) 24.2
T9 (+2-X) 24.2

SMA POWER SUPPLIES
+27 28.9
-27 -28.8
-6.8 7.1
measured NOM
supply rms volts
measured WATTS
SPEC WATTS
P/F
P
P
P

BILEVEL DIGITAL TELEMETRY, volts
SHE(1) ON 0.4
SHE(2) ON 4.3
SAM(1)/BUMPER(2) 0.2

MODE
SHE(2), SAM

PRESSURE, torr
1.1 req'd <= 2

TORQUE PULSES, usec
(100 scans) TAU A 778.2
TAU B 751.6
mean sigma
req'd 600 to 1000
P
P

ACTIVE SCAN TIME, usec
(100 scans) combined mean 60742.9
req'd 60742.8
sigma 60743.2
req'd 2.9
P
P

TURN ON TIME, sec
(time to reach within 10 usec of active scan time)
8.4 spec <= 60
P

Tested by

BA

SA STOP

11/23

ORIGINAL PAGE 19
OF POOR QUALITY

Scan 99: 1540

SMA Test: F-1 ACCEPT TEST
Serial Number: 4
Run Number: 30981.1540
Test Flow Event: R
Sequence Number: 6

SAM MODE operation

scan N: 99 no. of words transferred = 32

Line Length, N-1: 377 240 006 000
Active Scan Time, N-1: 60743.00
Final Time, N: 60743.11

TELEMETRY

Byte No	Name	Contents	Pulses	Time(usec)
1	SYNC	246		
2	OPSTAT N	106	Bit 7 = 0: Scan N= Forward	
3	SCNLIN N	130	88	16.58
4	TRNERR N	004 071	1081	203.71
5	TORPLS N	360 154	-3988	-751.54
6	SHSERR N-1	377 372	-6	-1.13
7	FHSERR N-1	000 006	6	1.13
8	SUMERR N-1	377 360 154	-3988	-751.54
9	SCNCTR	003 371		
10	SCNLIN N-1	250	-88	-16.58
11	TRNERR N-1	001 042	290	54.63
12	TORPLS N-1	357 337	-4129	-778.11
13	SHSERR N-2	000 011	9	1.70
14	FHSERR N-2	377 367	-9	-1.70
15	SUMERR N-2	377 357 337	-4129	-778.11
16	SCNTYM N-2	004 353 031	322329	60743.01
17	NSCANS	037	No.Scans =	31 (decimal)

scan N: 100 no. of words transferred = 31

Line Length, N-1: 000 257 367 377
Active Scan Time, N-1: 60742.81
Final Time, N: 60743.30

TELEMETRY

Byte No	Name	Contents	Pulses	Time(usec)
1	SYNC	246		
2	OPSTAT N	306	Bit 7 = 1: Scan N= Reverse	
3	SCNLIN N	250	-88	-16.58
4	TRNERR N	001 042	290	54.63
5	TORPLS N	357 337	-4129	-778.11
6	SHSERR N-1	000 012	10	1.88
7	FHSERR N-1	377 367	-9	-1.70
8	SUMERR N-1	377 357 337	-4129	-778.11
9	SCNCTR	003 372		
10	SCNLIN N-1	130	88	16.58
11	TRNERR N-1	004 071	1081	203.71
12	TORPLS N-1	360 154	-3988	-751.54
13	SHSERR N-2	377 372	-6	-1.13
14	FHSERR N-2	000 006	6	1.13
15	SUMERR N-2	377 360 154	-3988	-751.54
16	SCNTYM N-2	004 353 031	322329	60743.01
17	NSCANS	037	No.Scans =	31 (decimal)

ORIGINAL PAGE IS
OF POOR QUALITY

TS 32015-0045
Rev. B

DATA SHEET 4.3.7-2: OPERABILITY CHECKS

Manual Tests

SMA Designation F-1 S/N 4 SWE(1) (M) SWE(2) (M) ✓

Step

(a)

MUX Pulse Interfaces

Place check in blocks indicated after observing the waveform (see Figure 4.3-12). The signal low should be 40 ± 40 m volts, and the signal high should be 600 ± 40 mv. The pulse duration should be from 300 μ sec to 400 μ sec. (For Pseudo SWS just confirm their presence with a check)

SIGNAL	SWITCH POSITION	NOTE	SWITCH POSITION	COMPLEMENT	PSEUDO (40 μ sec)
Pulses	3 or 7	✓	4 or 8	✓	✓
Direction	1 or 5	✓	2 or 6	✓	✓

(b)

"SWE 1 ON MUX":

IF SWE (1) is ON (M)

IF SWE (2) is ON (M)

Logic 1

4.5 to 5.5 volts

Logic 0

0 to 0.8 volt ✓ Pass ✓ Fail

Date 3/9/81 QA Stamp



Test File Event R

Tested by JS

Comments

No. Req'd = 20

ORIGINAL PAGE IS
OF POOR QUALITY

DATA SHEET 4.3.7-1
OPERABILITY CHECKS
AUTOMATIC TESTS

TS 32013-004

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ATTACH TO DATA SHEET 4.3.7-1 OPERABILITY CHECKS - - AUTOMATIC CHECKS

attach to data sheet 4.3.7-1 operability check, 2 tape AT-FH, trk 0, file 2, run 101000

OPERABILITY CHECK
AUTOMATIC CHECK

SMA Designation: F-1 ACCEPT TEST
Serial Number: 4
Run Number: 30981.1546
Operation: SNE(2) BUMPER
Test Flow Event: R-7
Sequence Number: 6

TEMPERATURES
deg C
T1 (+Z) 26.4
T2 (-Z) 25.1
T3 (+X) 25.7
T4 (-X) 26.3
T5 (BRDG) 26.3
T6 (SAM) 27.1
T7 (SNE) 30.4
T8 (-Z-X) 24.2
T9 (+Z-X) 24.2

SMA POWER SUPPLIES
measured
+27 28.9
-27 -28.8
-6.8 7.1
supply rms volts
28 to 30
-28 to -30
6.3 to 7.7
measured
wamps
27.5
26.8
2263.9
SPEC
wamps
200
200
2500
P/F
P
P
P

BILEVEL DIGITAL
TELEMETRY, volts
SNE(1) ON 0.3
SNE(2) ON 4.3
SMA(1)/BUMPER(2) 3.9

NODE
SNE(2), BUMPER

PRESSURE, torr
1.2
req'd <= 2

TORQUE PULSES, usec
(100 scans)
TAU A 798.5
TAU B 901.8
mean
sigma
req'd

BUMPER-BUMPER TIME, usec combined
(100 scans)
71342.9
mean
sigma
req'd
71342.2
0.7
read
2.9
P P

TURN-ON TIME, sec
(time to reach within 10 usec of active scan time)
7.9
spec <= 60
P

Tested by

QA Stamp

NO. READ

ORIGINAL PAGE IS
OF POOR QUALITY

ACCEPT TEST
Serial Number: 4
Run Number: 30921.1546
Tag Flow Event: R
Sequence Number: 6

BUFFER MODE operation

scan N: 99 no. of words transferred = 32

Line Length, N-1: 005 306 322 000
Bumper to Bumper Time, N-1: 71343.2
Final Time, N: 60743.11

TELEMETRY

Byte No	Name	Contents	Pulses	Time(usec)
1	SYNC	246		
2	OPSTAT N	146		
3	SONLIN N	130	88	16.58
4	5 TRNERR N	000 000	0	0.00
6	7 TORPLS N	355 107	-4793	-903.24
8	9 SHSERR N-1	000 000	0	0.00
10	11 FHSERR N-1	000 000	0	0.00
12	13 14 SUMERR N-1	377 355 111	-4791	-902.87
15	16 SCHCTR	003 207		
17	17 SONLIN N-1	250	-88	-16.58
18	19 TRNERR N-1	000 000	0	0.00
20	21 TORPLS N-1	357 173	-4229	-796.96
22	23 SHSERR N-2	000 000	0	0.00
24	25 FHSERR N-2	000 000	0	0.00
26	27 28 SUMERR N-2	377 357 167	-4233	-797.71
29	30 31 SCHTYM N-2	004 353 023	322323	60741.83
32	NSCANS	037	No.Scans =	31 (decimal)

scan N: 100 no. of words transferred = 31

Line Length, N-1: 005 306 314 377
Bumper to Bumper Time, N-1: 71342.0
Final Time, N: 60743.11

TELEMETRY

Byte No	Name	Contents	Pulses	Time(usec)
1	SYNC	246		
2	OPSTAT N	346		
3	SONLIN N	250	-88	-16.58
4	5 TRNERR N	000 000	0	0.00
6	7 TORPLS N	357 171	-4231	-797.33
8	9 SHSERR N-1	000 000	0	0.00
10	11 FHSERR N-1	000 000	0	0.00
12	13 14 SUMERR N-1	377 357 166	-4234	-797.90
15	16 SCHCTR	003 207		
17	17 SONLIN N-1	130	88	16.58
18	19 TRNERR N-1	000 000	0	0.00
20	21 TORPLS N-1	355 107	-4793	-903.24
22	23 SHSERR N-2	000 000	0	0.00
24	25 FHSERR N-2	000 000	0	0.00
26	27 28 SUMERR N-2	377 355 111	-4791	-902.87
29	30 31 SCHTYM N-2	004 353 032	322330	60743.20
32	NSCANS	037	No.Scans =	31 (decimal)

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TS 32015-0044
Rev. B

DATA SHEET 4.3.7-2: OPERABILITY CHECKS

Manual Tests

SMA Designation F-1 S/N 7 SWE(1) (M) SWE(2) (M) ✓

Step

Bupr

(a)

MUX Pulse Interfaces

Place check in blocks indicated after observing the waveform (see Figure 4.3-12). The signal low should be 40 ± 40 mV, and the signal high should be 650 ± 40 mV. The pulse duration should be from 300 μ sec to 400 μ sec. (For Pseudo SAMS just confirm their presence with a check)

SIGNAL	SWITCH POSITION	NORM	SWITCH POSITION	COMPLEMENT	PSEUDO (40 μ sec) ^(M)
Pulses	3 or 7	✓	4 or 8	✓	✓
Direction	1 or 5	✓	2 or 6	✓	✓

(b)

"SWE 1 ON MUX":

IF SWE (1) is ON (✓)

IF SWE (2) is ON (✓)

Logic 1

4.5 to 5.5 volts

Logic 0

0 to 0.8 volt ✓ Pass ✓ Fail ✓

Date 3/9/81 O/S Stamp



Test Flow Event

R

Tested by

B

Comments

No. Req'd = 20

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DATA SHEET 4.3.8-1
OPERATIONAL PERFORMANCE
SCAN TO SCAN REPEATABILITY

TS 32015-004
8 March 1980

SMA Designation: 1 ACCEPT TEST

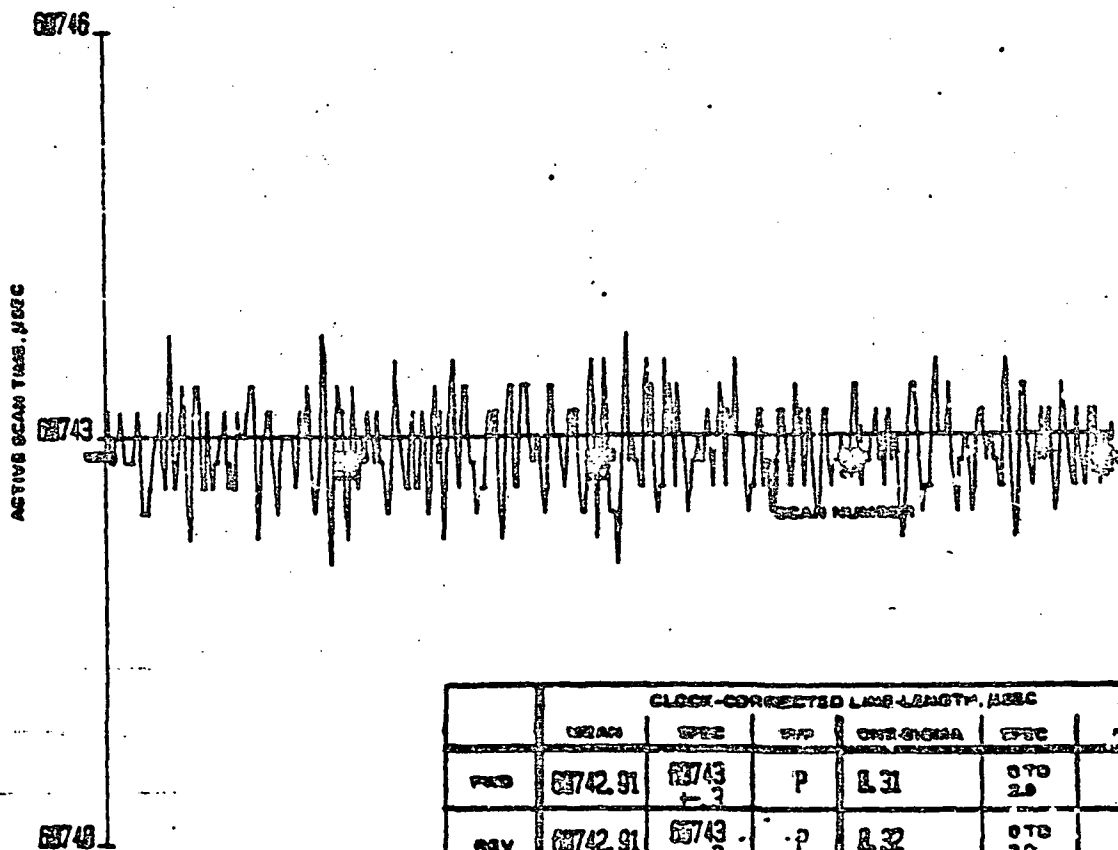
S/N: 4 SAM MODE 1
SME (1) or (2):

Voltage: High ☒ , Norm ☐ , Low ☐

28.9 -28.8 7.1

405 CONSECUTIVE
(280 FWD, 225 REV)

280 FWD
225 REV



	CLOCK-CORRECTED LINE LENGTH, μSEC					
	USAC	SPC	SP	ONE-GIGAB	SPC	W/P
FWD	60742.91	60743 ±.3	P	8.31	STD 2.9	P
REV	60742.91	60743 ±.3	-P	8.32	STD 2.9	P

Run No. 32015.1552

Test Flow Event R-9 seq 6

Comments test no. 9

QC Stamp



Date

3/9/81

Tested By

[Signature]

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300

DATA SHEET 4.3-2
OPERATIONAL PERFORMANCE
SCAN PARAMETERS

TS 32015-004

Rev 2

attach to data sheet 4.3.5-2

400Scan Parameter: M: rev121886

OPERATIONAL PERFORMANCE
SCAN PARAMETERS

SAR Designation: F-1 ACCEPT TEST

operation: SME(1) SAR

Serial Number: 4

Test Flow Event: R-9 Seq 6

Run Number: 30981.1552

Voltages: 28.9 -28.8 7.

temperatures	T1	T2	T3	T4	T5	T6	T7	T8	T9
	(+Z)	(-Z)	(+X)	(-X)	(BRDG)	(SAM)	(SME)	(-Z-X)	(+Z+X)
deg C	35.3	25.0	35.7	26.2	26.3	27.2	30.6	24.1	24.1

SCAN PARAMETER (400 scans)	MEASURED	REQUIREMENT	SPECIFICATION	P/F
----------------------------	----------	-------------	---------------	-----

clock freq: HZ	10612843	10612875 +-125		P
----------------	----------	----------------	--	---

torque pulse width: usec				
mean	767	<1100		P
sigma	14			

turn-around time: usec		10590 +- 68		
------------------------	--	-------------	--	--

bumper A: mean	10670.2			
sigma	0.1			

bumper B: mean	10524.7			
sigma	0.2			

active scan time: usec

fid: min	60742.1			
max	60743.8			
mean	60742.9			
sigma	0.3			

rev: min	60742.2			
max	60743.8			
mean	60742.9			
sigma	0.3			

combine: mean	60742.9	60743 +-0.2		P
sigma	0.3	<2.9		P

scan period: usec	142680.7	142666 +-140		P
-------------------	----------	--------------	--	---

scan rate var: percent

fid: min	-0.001	+-1		P
max	0.001			P
rev: min	-0.001			P
max	0.001			P

SAR offset (P0 mean): urad	-1.96			
----------------------------	-------	--	--	--

line start pulse angular

jitter (P0 sigma): urad	0.32	<1.00		P
-------------------------	------	-------	--	---

SAR angle: urad

fid: mean	134556			
sigma	0.37	<1		P

rev: mean	134555			
sigma	0.28	<1		P

Tested by JS QA

NO. REQ'D = 22

ORIGINAL PAGE IS
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11:11:11

Device	Col	Measurement
SHR-2	1	ERROR
MFC(-2-X)	3	24.144 Deg C
MFC(+2-X)	3	24.165 Deg C

Date: 030981 Time: 1552

Item Designation: F-1 ACCEPT TEST

Serial Number: 4

Run Number: 30981.1552

Test Flow Event: R

Test Number: 9

Sequence Number: 6

Pressure: 1.10E 00 TORR

INITIALIZE Words Transferred: 4

Word Number 0: INTERRUPT (Raw 177771 Octal)

Bit	Description	Setting
0	Panel Mode	1
1	Calibrate Mode	0
2	Scan Mode	0

Word Number 1: PANEL STATUS (Raw 042402 Octal)

Bit	Description	Setting
0	Bumper SW On	0
1	See SAM P0/P3	1
2	See SAM P2/P5	0
3	See SAM PA/PE	0
4	Processed SHM	1
5	Raw SAM	0
6	SAM 1 or SAM 2	0
7	SAM 3 (CAL SAM)	0
8	Single Reset	0
9	End SAM P0/P3	0
10	End SAM P2/P5	1
11	End SAM PA/PE	0
12	Ext. Reset	1
13	5 Facet	0
14	Calibrate Mode	0
15	Scan Mode	0
16	Initialize Mode	1
17	Slow Telemetry Mode	0

Word Numbers 2 and 3: (Raw 000000 007157 Octal)

Scan Count Preset:	7157 Octal	No. of Scans:	400
Time Count Preset:	0000000	No. of Samples:	0

Number of Scans of S# Dimension: 400

Dimension of S# Array: 15226

Dimension of W# Array: 800

ALIBRATE: SAM/SNE: 1

Facet	IFAD Counts	Preset Angles	No. a, b
P000	0.00	-6.7170900E-02	1.6392000E 05
P001	1.3920.00	0.0000000E 00	2.4423910E 05
P002	1.3920.00	2.7159200E-02	-1.2645252E 04

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20.00 0.00
20.00 0.00

Temperatures and Voltages

Ch	Scanner Out	Device	Cal	Measurement
0	-1.0000E-04	QUARTER	3	ERROR
1	0.0000E-02	EU=6.81	5	2244.600 mAmps
2	0.0000E-03	EU=+27I	5	29.000 mAmps
3	-1.2500E-03	EU=-27I	5	25.040 mAmps
4	0.0000E-03	SMA -Z	1	25.006 Deg C
5	1.9100E-03	SMA -X	1	26.178 Deg C
6	1.9100E-03	SMA +Z	1	26.300 Deg C
7	1.9500E-03	SMA +X	1	25.679 Deg C
8	1.9110E-03	TORQ BRDG	1	26.290 Deg C
9	0.1041E-02	SME TEMP	2	30.635 Deg C
10	1.8175E-03	SAM TEMP	1	27.200 Deg C
11	7.0921E-00	EU=6.8V	4	7.092 Volts
12	9.1089E-03	NF(-Z-X)	3	24.125 Deg C
13	9.1059E-03	NF(+Z-X)	3	24.148 Deg C
14	4.3363E-00	SME(1)TEL	4	4.336 Volts
15	2.3681E-01	SME(2)TEL	4	0.237 Volts
16	-1.0000E-04	SME PR U7	3	ERROR
17	3.8610E-00	SAM1/BMP2	4	3.861 Volts
18	2.8892E-01	EU=+27V	4	28.892 Volts
19	-2.8833E-01	EU=-27V	4	-28.833 Volts

IF 'ERROR 40' OCCURS DURING MARKING OF TAPE:
type:to REMARK---press execute---press continue

Data Tape Identifier: FID8
Track for Data: 0
Init/Cal Data File Number: 7
Scan Data File Number: 8

IF 'ERROR 40' OCCURS DURING MARKING OF TAPE:
type:to REMARK---press execute---press continue

Data Tape Identifier: FID8
Track for Data: 0
Init/Cal Data File Number: 7
Scan Data File Number: 8

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TS 32015-004
8 March 1980

DATA SHEET 4.3.5-1
OPERATIONAL PERFORMANCE
SCAN TO SCAN REPEATABILITY

SMA Designator: -1 ACCEPT TEST

S/N: 4

BUMPER CODE

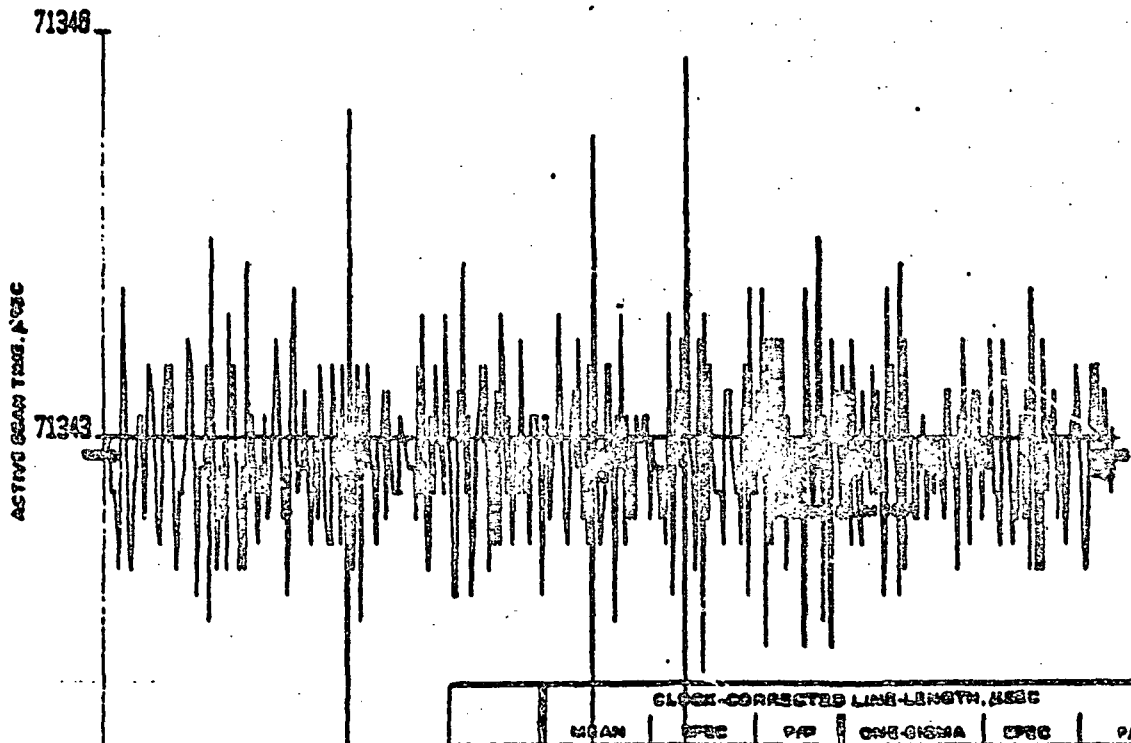
SSM (1) or (2): 1

Voltage: High ☒ , Nom ☐ , Low ☐

28.9 -28.8 7.1

480 OBSERVATIVE
0200 PWD, 230 REV

280 FWD
280 REV



CLOCK-CORRECTED LINE LENGTH, μ SEC						
	MEAN	SPEC	P/P	CNS-CISMA	CPSC	P/P
FWD	71342.87	71343	P	1.64	0.70 2.0	P
REV	71342.87	71343	P	1.64	0.70 2.0	P

Run No. 33991.1634

Test Flow Event R-11 eq 8

Comment: test no. 11

QC Stamp



Date

3/8/81

Tested By

[Signature]

NO. REQ'D - 22
VOLUME

ORIGINAL PAGE 13
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DATA SHEET 4302
OPERATIONAL PERFORMANCE
SCAN PARAMETERS

TS 32013-004

Rev 3

attach to data sheet 4.3.5-2 400scan parameters (total) (total) 11800

OPERATIONAL PERFORMANCE
SCAN PARAMETERS

Sim Destination: F-1 ACCEPT TEST operation: SHEET BUMPER
Serial Number: 4 Test Flow Event: P-11 Sea 5
Run Number: 30981.1604 Voltages: 28.9 -28.8 7.1
temperatures T1 T2 T3 T4 T5 T6 T7 T8 T9
(+2) (-2) (+X) (-X) (BRDG) (SME) (-2-X) (+2-X)
deg C 26.3 25.0 25.6 26.2 26.2 27.3 30.8 24.1 24.1

SCAN PARAMETER (400 scans) MEASURED REQUIREMENT SPECIFICATION P/F

clock freq, HZ 10612844 10612875 +-125 P

torque pulse width, usec 854 <1100 P
mean 18

bumper to bumper time, usec
fwd: min 71340.5
max 71345.8
mean 71342.9
sigma 0.6
rev: min 71340.7
max 71345.2
mean 71342.9
sigma 0.6
combined: mean 71342.9
sigma 0.6
scan period, usec 142685.7 71343 +-0.8
142686 +-1.6 <2.9 P P P

scan rate var, percent
fwd: min -0.003
max 0.004
mean -0.003
sigma 0.003

Tested by

QA

NO. REQ'D - 22

ORIGINAL PAGE IS
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TS 32015-004
8 March 1960

DATA SHEET 4.3.6-3
OPERATIONAL PERFORMANCE
ALONG SCAN GEOMETRIC REPEATABILITY

SAH MODE (and calibrated)

Voltage: High _____, Norm _____, Low _____

SMA Designation F-1 ACCEPT TEST S/N 4

IPAR COUNTS:

CALIBRATION

BUMPER A

P2 P3

MID - P1 P4

P3 P6

BUMPER B

BEAMING

GAIN OFFSETS, μ RAD

DEAN VALUES

P2	1.7	P3	1.3
P1	5.1	P4	1.4
P0	1.6	P5	2.8
		LAST P0	2.1

TEMP: T1 T2 T3 T4 T5 T6 T7 T8 T9

28.2 24.8 23.5 22.8 22.1 27.2 32.8 24.8 24.8

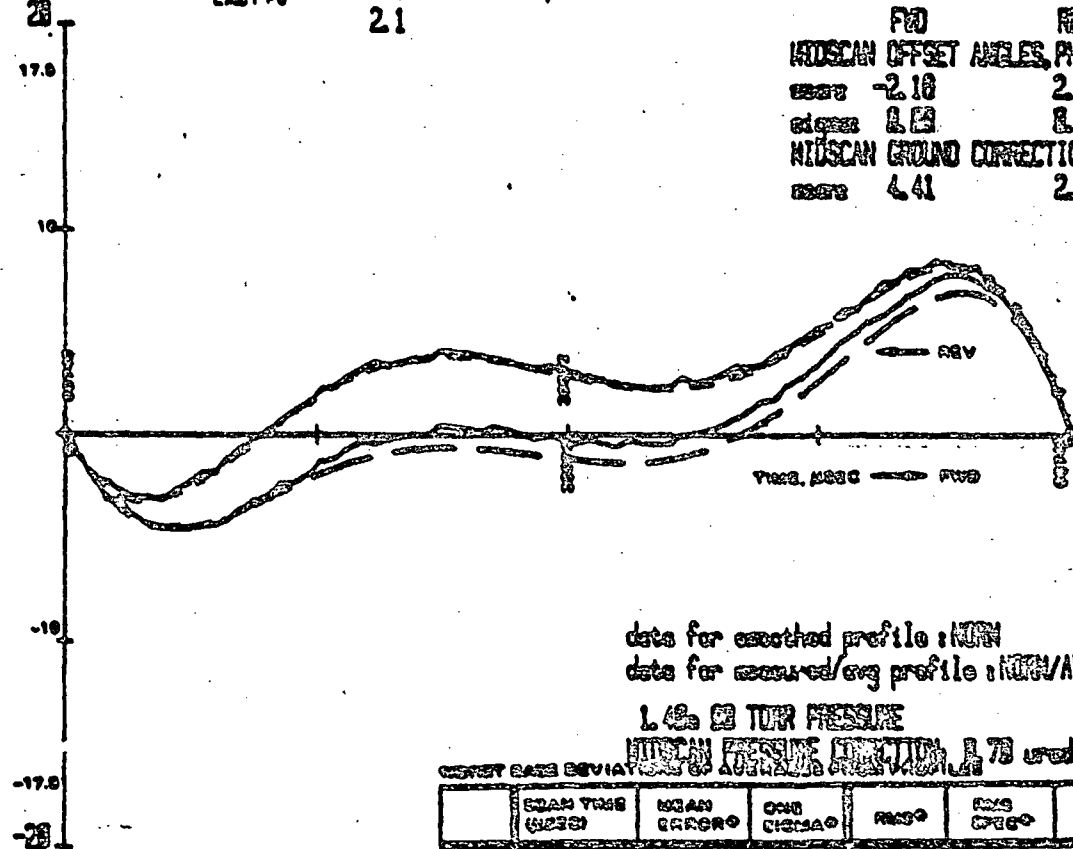
SAM ANGLES
USED (M/RAS) -57.171 57.159

PRO SMOOTHED PROFILE
ADDED SCAN RUN NO. 152
REV SMOOTHED PROFILE
MEASURED AVG. PRO
MEASURED AVG. REV

PRO REV
MIDSCAN OFFSET MM, P.M.F. P.M.F.

mean	-2.18	2.28
sigma	1.13	1.13
MIDSCAN GROUND CORRECTION		
mean	4.41	2.14

DEAN VALUES, μ RAD



data for smoothed profile: NORM
data for measured/avg profile: NORM/AVG

1.42 μ RAD TUR PRESSURE

MIDSCAN GROUND CORRECTION 1.73 μ RAD

	SCAN TIME (SEC)	MEAN ERROR	ONE SIGMA	PRO	REV	P/P
PRO	2012.12	1.15	1.27	1.18		
REV	2341.24	1.41	1.33	1.51	11.73	P

ON MICROFILM

Run No. 3593L 1637

Test Flow Event R-13 eq 8

Comments test no 13 19 END/10 REV SCAN 75pts each

QA Stamp



Date 3/8/60

Tested By

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TS 32015-004
8 March 1980

DATA SHEET 4.3.6-3
OPERATIONAL PERFORMANCE
ALONG SCAN GEOMETRIC REPEATABILITY

SAM CODE (and calibrated) deviation profile

SMA Designation F-1 ACCEPT TEST S/N4

SME (1) or (2) 1

Voltage: High —, Nom —, Low —

28.9 -28.0 7.1

IFAR COUNTS:

CALIBRATION

K = 0.500091

TEMP: T1 T2 T3 T4 T5 T6 T7 T8 T9

26.2 24.0 25.5 28.0 28.1 27.2 31.9 24.0 24.0

SAM ANGLES
USED (MRAD) -57.171 67.159

BUMPER A

P2 P3

MID - P1 P4

P0 P0

BUMPER B

SCANNING

SAM OFFSETS, MRAD

MEAN
VALUES

P2

1.7

P3

1.3

P1

5.1

P4

1.4

P0

1.8

P0

2.0

LAST P0

2.1

PWD SMOOTHED PROFILE
(FROM TPE-M RUN NO. 2781.154)
REV SMOOTHED PROFILE
MEASURED AVE, PWD
MEASURED AVE, REV

FWG

REV

MIDSCAN OFFSET ANGLES, PHI, PHI-

error -2.18 2.28

error 0.00 0.00

MIDSCAN GROUND CORRECTION

error 4.41 2.14

NON-LINEARITY, MRAD

5

17.8

10

-10

-17.8

-5

data for smoothed profile: NORM
data for measured/avg profile: NORM/AVG

1.40e 03 TORR PRESSURE
MIDSCAN PRESSURE CORRECTION: 0.70 used

WORST CASE DEVIATIONS OF AVERAGES FROM PROFILES

	SCAN TIME (MSEC)	MEAN ERROR	ONE SIGMA	FWG	REV SPEC	P/P
PWD	29128.02	1.15	0.27	1.18		
REV	23464.24	0.41	0.30	0.51	0.70	P

Run No. 30981.1637

Test Flow Event R-13 seq 6

Comments test no. 13, 19 FWD/19 REV SCAN, 75000 each

QA Stamp

Date

Tested By

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DATA SHEET 4.18-4
OPERATIONAL PERFORMANCE
CROSS SCAN REPEATABILITY

TS 32015-004
8 March 1980

SMA Designation F-1 ACCEPT TEST S/N 4

SAW MODE (1) or (2) 1

Voltage: High ☒ , Nom ☐ , Low ☐

20.9 -20.9 7.1

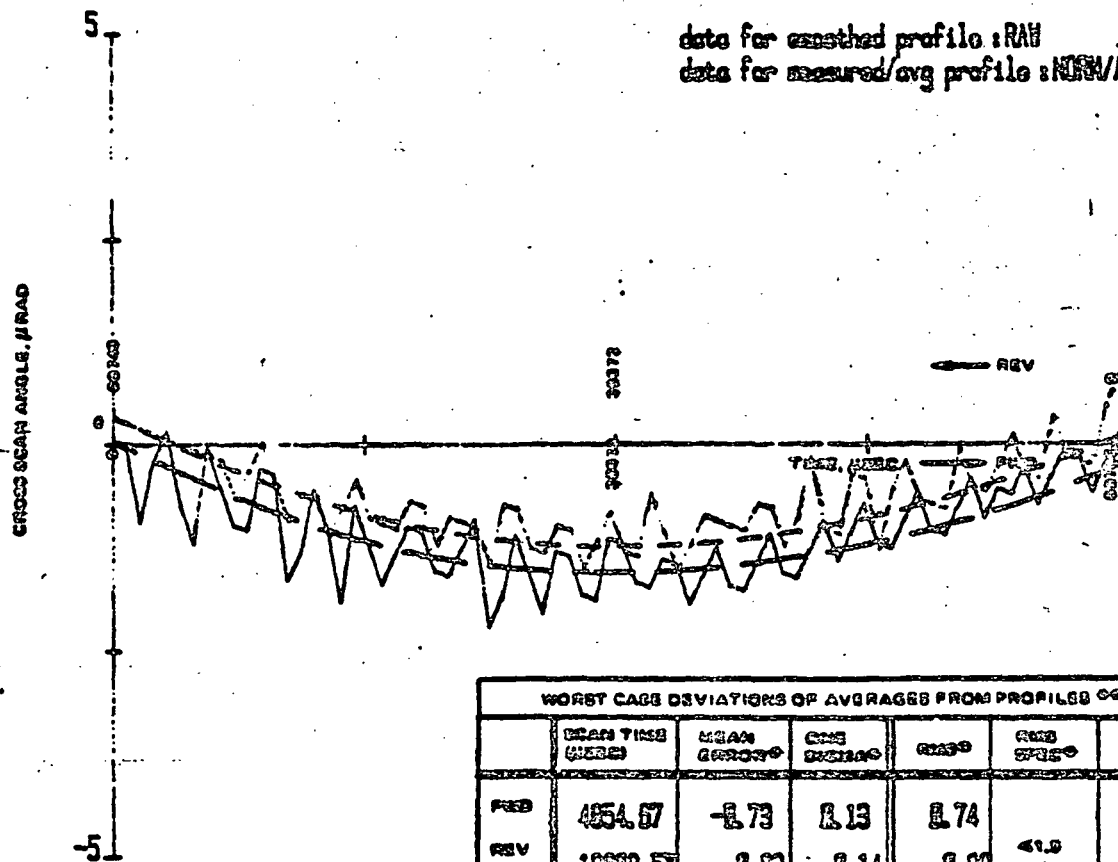
FORWARD LINEAR (PAR-ALIGNMENT)
TERM REMOVED:

98.93 μ rad

(FROM TPE-P RUN NO.

— FWD SMOOTHED PROFILE
(FROM TPE-P RUN NO. 1579)
— REV SMOOTHED PROFILE
— MEASURED AVG, FWD
— MEASURED AVG, REV

date for smoothed profile: RAW
date for measured avg profile: NOW/AVG



WORST CASE DEVIATIONS OF AVERAGES FROM PROFILES 00						
	MEAN TIME (μSEC)	MEAN CROSS (μRAD)	CROSS (μRAD)	MEAN FWD (μRAD)	MEAN REV (μRAD)	PP
FWD	4854.67	-1.73	1.13	1.74		P
REV	10889.57	1.83	1.14	1.83	<1.0	P

PRESSURE:

1.45 μ rad

0 MICRORADIANS
00 AFTER REMOVING THE LINEAR
(PAR-ALIGNMENT TERM THAT WAS REMOVED
FROM THE ORIGINAL PROFILE

Run No. 30981.1637

Test Flow Event R-13 seq 6

Comments test no. 13

QA Stamp

Tested By

Date 30981

SECRET

Order	Supplier Code	Part No.	Cal	Measurement
1	010001B	SMH -1	1	24.953 Deg C
12	010002B	MFC-2-10	3	24.113 Deg C
13	010004B	MFC-2-10	3	24.192 Deg C

Date: 030981 Time: 1604

SMS 2-135001-1001 F-1 ACCEPT TEST

Series: NLS-80-1

Run Number: 30901.1604

Test Flow Event

Page Number: 11

Signature: _____

Pressure: 1.15E 00 TORR

```
INITIALIZE      Words Transferred:  4
```

Word Number 0: INTERRUPT (Row 177771 Octal)

Bit	Description	Setting
0	Panel Mode	1
1	Calibrate Mode	0
2	Scan Mode	0

Word Number 1: PANEL STATUS (Row 042402 Octal)

Bit	Description	Setting
0	Bumper SW On	0
1	Bea SAM P0/P3	1
2	Bea SAM P2/P5	0
3	Bea SAM PA/PB	0
45	Processed SAM	1
45	Raw SAM	0
45	SAM 1 or SAM 2	0
45	SAM 3 (CAL SAM)	0
6	Single Reset	0
7	End SAM P0/P3	0
8	End SAM P2/P5	1
9	End SAM PD/PE	0
10	Ext Reset	1
11	5 Facet	0
12	Calibrate Mode	0
13	Scan Mode	0
14	Initialize Mode	1
15	Slow Telemetry Mode	0

```

Word Numbers 2 and 3:          (Raw 0000000 007157 Octal)
Scan Count Preset:             7157 Octal      No. of Scans:         400
Time Count Preset:             0000000         No. of Samples:         0

```

```
Number of Scans of S4 Dimension: 400
Dimension of S4 array: 15328
Dimension of A4 Array: 800
```

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2017-2018

DATE	DESCRIPTION	AMOUNT	DATE	DESCRIPTION	AMOUNT
1994-01-01	0.00		1994-01-01	0.00	
1994-01-01	0.00		1994-01-01	0.00	
1994-01-01	0.00		1994-01-01	0.00	
1994-01-01	0.00		1994-01-01	0.00	

$$r_k = 0.500000$$

Blower A: 0.00

Summa: B: 0.00

Temperatures and Voltages

Ch	Scanner Out	Device	Cal	Measurement
0	-1.0000E-04	QUARTER	3	ERROR
1	2.2683E-02	EU=6.81	5	2268.300 mAmps
2	1.4900E-03	EU=+27I	5	29.800 mAmps
3	-1.2920E-03	EU=-27I	5	25.940 mAmps
4	2.0046E-03	SMA -Z	1	24.939 Deg C
5	1.9204E-03	SMA -X	1	26.156 Deg C
6	1.9111E-03	SMA +Z	1	26.288 Deg C
7	1.9371E-03	SMA +X	1	25.629 Deg C
8	1.9142E-03	TORQ. BRDG	1	26.243 Deg C
9	9.0698E-02	SNE TEMP	2	30.770 Deg C
10	1.8424E-02	SAM TEMP	1	27.273 Deg C
11	7.0879E-00	EU=6.8V	4	7.088 Volts
12	9.1130E-03	MF(-Z-X)	3	24.092 Deg C
13	9.1099E-03	MF(+Z+X)	3	24.116 Deg C
14	4.3371E-00	SNE(1) TEL	4	4.337 Volts
15	4.1768E-01	SNE(2) TEL	4	0.418 Volts
16	-1.0000E-04	SME PR U7	3	ERROR
17	1.7988E-01	SAM1 BMP2	4	0.180 Volts
18	2.8890E-01	EU=+27V	4	28.890 Volts
19	-2.8931E-01	EU=-27V	4	-28.931 Volts

IF 'ERROR 60' OCCURS DURING MARKING OF TAPE:
 4 00:40 REMARK---press execute---press continue

Tape Identifier:	F128
Track for Data:	0
Input Data File Number:	9
Output Data File Number:	10

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.....:ACCEPT-Filter:Circle4:re:011731

=====TEST INITIAL CONDITIONS=====

- 1) Fans must be off for at least 20 min.
- 2) Both Lasers must be on at least 45 min
- 3) BPS temp (+Z-X) must be +/- 1 deg from (-Z-X)
- 4) Chamber pressure must be less than 2 torr
- 5) Cross axis polarity correct

=====

temperatures and Voltages

Ch	Scanner Out	Device	Cal	Measurement
4	2.0144E 03	SMA -Z	1	24.846 Deg C
12	9.1210E 03	MF(-Z-X)	3	24.029 Deg C
13	9.1172E 03	MF(+Z+X)	0	24.059 Deg C

Date: 030981 Time: 1637

SMA Designation: F-1 ACCEPT TEST
 Serial Number: 4
 Run Number: 30981.1637
 Test Flow Event: R
 Test Number: 13
 Sequence Number: 6

INITIALIZE Words Transferred: 4

Word Number 0: INTERRUPT (Raw 177771 Octal)

Bit	Description	Setting
0	Panel Mode	1
1	Calibrate Mode	0
2	Scan Mode	0

Word Number 1: PANEL STATUS (Raw 042402 Octal)

Bit	Description	Setting
0	Bumper SW On	0
1	Beq SAM P0/P3	1
2	Beq SAM P2/P5	0
3	Beq SAM PA/PB	0
45	Processed SAM	1
45	Raw SAM	0
45	SAM 1 or SAM 2	0
45	SAM 3 (CAL SAM)	0
6	Single Reset	0
7	End SAM P0/P3	0
8	End SAM P2/P5	1
9	End SAM PD/PE	0
10	Ext Reset	1
11	5 Facet	0
12	Calibrate Mode	0
13	Scan Mode	0
14	Initialize Mode	1
15	Slow Telemetry Mode	0

Word Numbers 2 and 3: (Raw 176747 057730 Octal)

Scan Count Preset:	7730 Octal	No. of Scans:	39
Time Count Preset:	3757165	No. of Samples:	75

Number of Scans of S# Dimension: 41
 Scans x Samples: 3075
 Number of Samples plus 1: 76
 Dimension of S# Array: 14950
 Dimension of M# Array: 82

ORIGINAL PAGE IS
OF POOR QUALITY

-----P0P5-----
Along Cross A-Octal-B
0.00 0.00 Minutes: 998.38
0.00 0.00

-----BUMPER B-----
Along Cross A-Octal-B
-3153.00 -2.00 Minutes: 998.77
Sigma 0.00 0.86

-----P1P2-----
Along Cross A-Octal-B
164225.26 114.60 Minutes: 999.03
Sigma 0.44 0.94

-----BUMPER A-----
Along Cross A-Octal-B
331968.30 239.30 Minutes: 999.47
Sigma 0.00 0.47

-----P2P3-----
Along Cross A-Octal-B
Avg 191040.55 134.92 Minutes: 999.78
Sigma 60788.06 45.92

E-CALIBRATION OF PREVIOUS MIRROR POSITION

Along Cross A-Octal-B
Avg 328391.39 238.48 Minutes: 1000.95
Sigma 0.49 0.50

-----P0P5-----
Along Cross A-Octal-B
Avg 1.87 1.08 Minutes: 1001.47
Sigma 0.34 0.58

Along Scan Calibration
Time at end of Cal: 1641.28

Facet	IFAR Counts	Preset Angles	No. a, b
P0P5	1.87 1.08	-6.7170900E-02	1.6422673E 05
P1P4	164226.73 119.45	0.0000000E 00	2.4464871E 06
P2P3	328391.70 238.66	6.7159200E-02	1.3900063E 04

K = 0.500091

Bumper A: 331969.21
Bumper B: -3151.37

Conversion factor: 0.409urad/IFAR count
SHIFT RATE: 0.14urad/min
desired: 97.19urad

TELEMETRY PRINTOUT, 1: tapeAT-F, trk0, file15, rev22381

TELEMETRY PRINTOUT, 1: tapeAT-F, trk0, file15, rev22381

Data: 030981 Time: 1637

ORIGINAL PAGE IS
OF POOR QUALITY

Data Description: F-1 ACCEPT TEST

Serial Number: 4

Run Number: 30981.1637

Flow Event: R

Test Number: 13

Sequence Number: 6

data tape identifier: F1D8

track for data: 1

INITIAL data file number: 1

SQN data file number: 2

NORM/AVG SCAN data file number: 3

Smoothing Coeffs file number: 0

mode selected: NORM/AVG

TELEMETRY PRINTOUT, 2: tapeAT-F, trk0, file16, rev22381

Data Date: 030981 Data Time: 1637

SCAN MODE operation

Scan N: 1 no. of words transferred = 187

Line Length, N-1: 377 140 011 000

Active Scan Time, N-1: 60743.19

Final Time, N: 60743.30

TELEMETRY

Byte No	Name	Contents	Pulses	Time(usec)
1	SYNC	006		
2	OPSTAT N	006		
3	SCNLIN N	130	88	16.58
4	5 TRNERR N	004 010	1032	194.48
6	7 TORPLS N	360 150	-3992	-752.29
8	9 SHSERR N-1	377 366	-10	-1.88
10	11 FHSERR N-1	000 011	9	1.70
13	14 SUMERR N-1	377 360 152	-3990	-751.92
15	16 SCNCTR	000 275		
17	SCNLIN N-1	250	-88	-16.58
18	19 TRNERR N-1	001 001	257	48.43
20	21 TORPLS N-1	357 334	-4132	-778.68
22	23 SHSERR N-2	000 022	18	3.39
24	25 FHSERR N-2	377 357	-17	-3.20
27	28 SUMERR N-2	377 357 334	-4132	-778.60
29	30 31 SCNTYM N-2	004 353 030	322328	60742.82
32	NSCANS	024	No.Scans =	20 (decimal)

Scan N: 2 no. of words transferred = 182

Line Length, N-1: 001 057 356 377

Active Scan Time, N-1: 60743.00

Final Time, N: 60742.92

TELEMETRY

Byte No	Name	Contents	Pulses	Time(usec)
1	SYNC	200		
2	OPSTAT N	101		
3	SCNLIN N		88	16.58

ORIGINAL PAGE 19
OF POOR QUALITY

Line	Length	Time	Contents	Pulses	Time (usec)
001	057	355	377		
004	010			1032	194.48
030	150			-3992	-751.92
037	355	152		-10	-1.88
000	011			9	1.70
037	355	152		-3990	-751.92
004	353	032		322330	60743.20
037				No.Scans =	31 (decimal)

scan 11: 33 no. of words transferred = 182

Line Length-N-1: 001 057 355 377
Active Scan Time-N-1: 60743.00
Final Time-N: 60743.20

TELEMETRY

Byte No	Name	Contents	Pulses	Time (usec)
1	SYNC	200		
2	OPSTAT N	006	Bit 7 = 1: Scan N = Reverse	
3	SONLIN N	250	-88	-16.58
4	TPNERR N	001 001	257	48.43
5	TOPFLS N	357 334	-4132	-778.68
8	SHSERR N-1	000 012	18	3.39
10	PHSERR N-1	377 355	-18	-3.39
12	13 14 SUNEPR N-1	377 357 334	-4132	-778.68
15	16 SONCTR	000 320		
17	SONLIN N-1	130	88	16.58
19	19 TPNERR N-1	004 007	1031	194.29
20	21 TOPFLS N-1	360 152	-3990	-751.92
22	23 SHSERR N-2	377 366	-10	-1.88
24	25 PHSERR N-2	000 013	11	2.07
26	27 28 SUNEPR N-2	377 360 152	-3990	-751.92
29	30 31 SONCTM N-2	004 353 030	322328	60742.82
32	NSCANS	037	No.Scans =	31 (decimal)

scan N: 33 no. of words transferred = 181

Line Length-N-1: 377 140 012 000
Active Scan Time-N-1: 60743.00
Final Time-N: 60743.48

TELEMETRY

Byte No	Name	Contents	Pulses	Time (usec)
1	SYNC	200		
2	OPSTAT N	006	Bit 7 = 0: Scan N = Forward	
3	SONLIN N	130	88	16.58
4	TPNERR N	004 007	1031	194.29
5	TOPFLS N	360 152	-3990	-751.92
8	SHSERR N-1	377 366	-10	-1.88
10	PHSERR N-1	000 012	10	1.88
12	13 14 SUNEPR N-1	377 360 152	-3990	-751.92
15	16 SONCTR	000 320		
17	SONLIN N-1	250	-88	-16.58
19	19 TPNERR N-1	001 001	257	48.43
20	21 TOPFLS N-1	357 334	-4132	-778.68
22	23 SHSERR N-2	000 022	18	3.39
24	25 PHSERR N-2	377 355	-18	-3.39
26	27 28 SUNEPR N-2	377 357 334	-4132	-778.68
29	30 31 SONCTM N-2	004 353 031	322329	60743.01
32	NSCANS	037	No.Scans =	31 (decimal)

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OF POOR QUALITY

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DATA SHEET 4.3.5-1
OPERATIONAL PERFORMANCE
SCAN TO SCAN REPEATABILITY

TS 32015-004
8 March 1980

SMA Designation: -1 ACCEPT TEST

S/N: 4

SAN MODE

2

SMR (1) or (2):

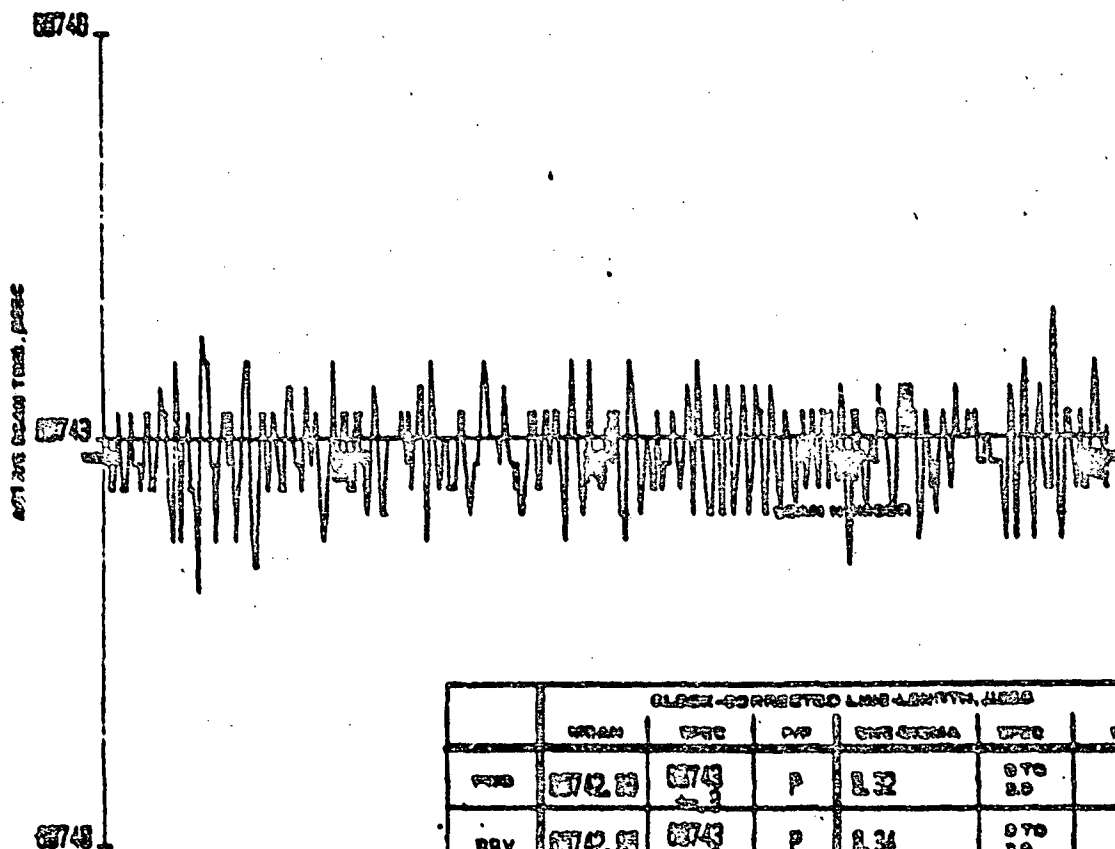
Volts: High , Nom , Low

28.9 -28.8 7.1

020 CONSECUTIVE
(020 FWD, 020 REV)

288 FWD

288 REV



0252-CORRECTED LINE LENGTH, 0253						
	0252	0253	0254	0255	0256	0257
FWD	02743	02743	P	2.32	0.70	P
REV	02743	02743	P	2.34	0.70	P

Run No. 3338L 1614

Test Flow Event R-16 acq 8

Comments Test no. 18

QC Stamp

Date

Tested By

0252-0253
VOLUME

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DATA SHEET 4.3.5-2
OPERATIONAL PERFORMANCE
SCAN PARAMETERS

TS 32015-004

316

attach to data sheet 4.3.5-2

400 scan parameters report rev 121850

OPERATIONAL PERFORMANCE
SCAN PARAMETERS

SME designation: F-1 ACCEPT TEST

Serial Number: 4

Run Number: 30981.1614

operation: SME(2) SAM
Test Flow Events: R-16 Set 6
Voltages: 28.9 -28.8 7.1

temperatures	T1 (+2)	T2 (-2)	T3 (+X)	T4 (-X)	T5 (BRDG)	T6 (SAM)	T7 (SME)	T8 (-2-X)	T9 (+2-X)
deg C	26.3	24.9	25.6	26.1	26.2	27.1	30.6	24.1	24.1

SCAN PARAMETER (400 scans) MEASURED REQUIREMENT SPECIFICATION P/F

clock freq: Hz 10612843 10612875 +-125 P

torque pulse width: usec
mean 765 <1100 P
sigma 13

turn-around time: usec 10590 +- 68
bumper A: mean 10664.6
sigma 0.1
bumper B: mean 10515.4
sigma 0.2

active scan time: usec
fwd: min 60741.9
max 60743.9
mean 60742.9
sigma 0.3
rev: min 60742.1
max 60743.8
mean 60742.9
sigma 0.3
combined: mean 60742.9 60743 +-0.2 P
sigma 0.3 <2.9 P
scan period: usec 142665.9 142666 +-140 P

scan rate var: percent +-1
fwd: min -0.002
max 0.002
rev: min -0.001
max 0.001 P

SAM offset(P0 mean): urad -10.65
line start pulse angular
jitter(P0 sigma): urad 0.35 <1.00 P

SAM angle: urad
fwd: mean 134585
sigma 0.38 <1 P
rev: mean 134582
sigma 0.30 <1 P

NO. REQ'D = 22

ORIGINAL PAGE IS
OF POOR QUALITY

4000000 collection; 1 tape RT-FM; trk1; file4; rev121880

Temperatures and Voltages

Ch	Scanner Out	Device	Col	Measurement
4	2.0038E 03	SMA -Z	1	24.920 Deg C
12	9.1135E 03	MF(-Z-X)	3	24.088 Deg C
13	9.1113E 03	MF(+Z+X)	3	24.105 Deg C

Date: 030981

Time: 1614

SMA Designation: F-1 ACCEPT TEST
 Serial Number: 4
 Run Number: 30981.1614
 Test Flow Event: R
 Test Number: 16
 Sequence Number: 6
 Pressure: 1.20E 00 TORR

INITIALIZE

Words Transferred: 4

Word Number 0: INTERRUPT (Raw 177771 Octal)

Bit	Description	Setting
0	Panel Mode	1
1	Calibrate Mode	0
2	Scan Mode	0

Word Number 1: PANEL STATUS (Raw 042402 Octal)

Bit	Description	Setting
0	Bumper SW On	0
1	Beq SAM P0/P3	1
2	Beq SAM P2/P5	0
3	Beq SAM PA/PB	0
45	Processed SAM	1
45	Raw SAM	0
45	SAM 1 or SAM 2	0
45	SAM 3 (CAL SAM)	0
6	Single Reset	0
7	End SAM P0/P3	0
8	End SAM P2/P5	1
9	End SAM PD/PE	0
10	Ext Reset	1
11	S Facet	0
12	Calibrate Mode	0
13	Scan Mode	0
14	Initialize Mode	1
15	Slow Telemetry Mode	0

Word Numbers 2 and 3: (Raw 000000 007157 Octal)

Scan Count Preset: 7157 Octal No. of Scans: 400
 Time Count Preset: 0000000 No. of Samples: 0

Number of Scans of S\$ Dimension: 400

Dimension of S\$ Array: 15226

Dimension of W\$ Array: 800

LIBRATE: SAM/SME: 2

Facet	IFAR Counts	Preset Angles	No. a, b
P0P5	0.00	-6.7182000E-02	1.6392000E 05
P1P4	163930.00	0.0000000E 00	2.4421805E 06
P2P3	337840.00	6.7159700E-02	-2.4095374E 04

ORIGINAL PAGE IS
OF POOR QUALITY

Scanner M: 0.00
Scanner E: 0.00

Temperatures and Voltages

Ch	Scanner Out	Device	Cal	Measurement
0	-1.0000E 04	QUARTER	3	ERROR
1	2.2628E-02	EU=6.8I	5	2262.800 mAmps
2	1.4050E-03	EU=+27I	5	28.120 mAmps
3	-1.2400E-03	EU=-27I	5	24.800 mAmps
4	2.0076E 03	SMA -Z	1	24.925 Deg C
5	1.9239E 03	SMA -X	1	26.104 Deg C
6	1.9137E 03	SMA +Z	1	26.252 Deg C
7	1.9597E 03	SMA +X	1	25.591 Deg C
8	1.9168E 03	TORQ BRDG	1	26.207 Deg C
9	8.1221E 02	SME TEMP	2	30.564 Deg C
10	1.8540E 03	SAM TEMP	1	27.107 Deg C
11	7.0879E 00	EU=6.8V	4	7.088 Volts
12	9.1162E 03	MF(-Z-X)	3	24.067 Deg C
13	9.1129E 03	MF(+Z+X)	3	24.093 Deg C
14	4.4410E-01	SME(1)TEL	4	0.444 Volts
15	4.3476E 00	SME(2)TEL	4	4.348 Volts
16	-1.0000E 04	SME PR U7	3	ERROR
17	1.7996E-01	SAM1/BMP2	4	0.180 Volts
18	2.8891E 01	EU=+27V	4	28.891 Volts
19	-2.8832E 01	EU=-27V	4	-28.832 Volts

=====

IF 'ERROR 60' OCCURS DURING MARKING OF TAPE:

type:ato REMARK---press execute--press continue

=====

Data Tape Identifier: F-1 AC

Track for Data: 0

Init/Cal Data File Number: 11

Scan Data File Number: 12

Data Tape Identifier: F1D8

Track for Data: 0

Init/Cal Data File Number: 11

Scan Data File Number: 12

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DATA SHEET 4.3.5-1
OPERATIONAL PERFORMANCE
SCAN TO SCAN REPEATABILITY

TS 32015-004
8 March 1980

SMA Designation - 1 ACCEPT TEST

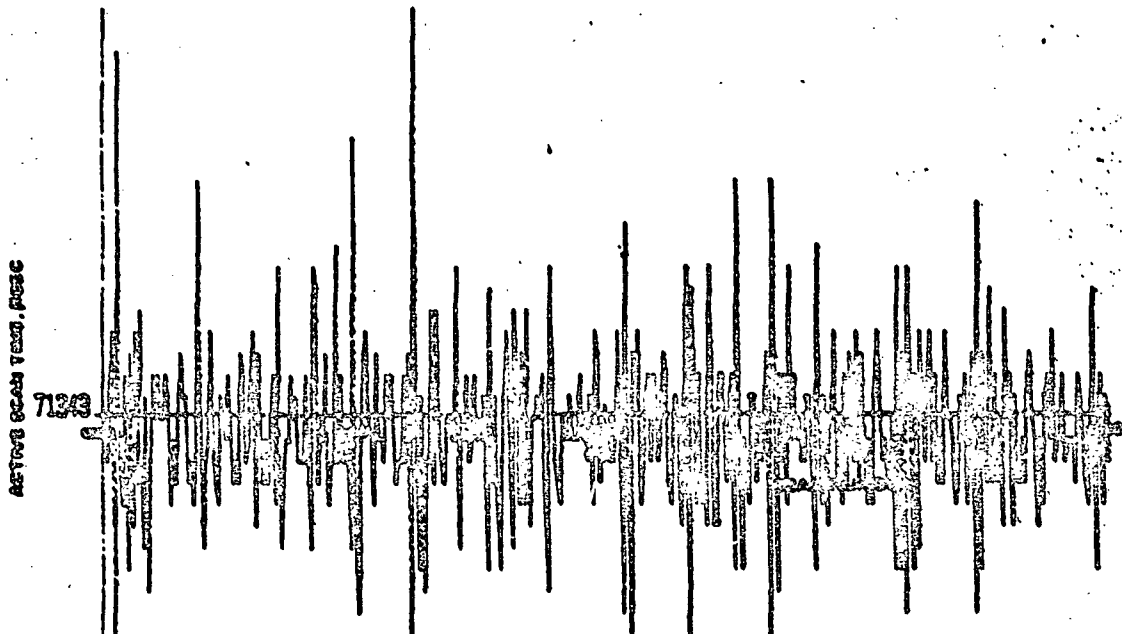
S/N: 4 BLUPR NITE 2
SMB (1) or (2):

Voltage: High , Nom , Low

21.8 -21.8 7.1

CCS OPERATIVE
CCS PWS, CCS REV

23 FWD
23 REV



	CLEAN-CORRECTED LINE LENGTH, INCH					
	CCS	CCS	CCS	CCS	CCS	CCS
PWS	7132.07	7133	P	L.0	0.75	P
REV	7132.07	7133	P	L.0	0.75	P

Run No. 3201.1624

Test Plan Event R-18 seq 8

Comments test no. 18

CC Stamp Date 3/8/80

Tested By

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DATA SHEET 4253
OPERATIONAL PERFORMANCE
SCAN PARAMETERS

TS 32015-004

Rev 3

attach to data sheet 4.3.5-2 400scan parameter, tape RT, rev 121880

OPERATIONAL PERFORMANCE
SCAN PARAMETERS

SMA Designation: F-1 ACCEPT TEST operation: SNE(2) BUMPER
Serial Number: 4 Test Flow Event: R-18 Sea 6
Run Number: 30981.1624 Voltages: 28.9 -28.8 7.1
temperatures T1 T2 T3 T4 T5 T6 T7 T8 T9
(+Z) 26.2 24.9 25.5 26.0 (-X) (SME) (-Z-X) (+Z+X)
dev C 26.2 24.9 25.5 26.0 26.2 27.0 30.6 24.0 24.1

SCAN PARAMETER(400 scans) MEASURED REQUIREMENT SPECIFICATION P/F

clock freq, HZ 10612843 10612875 +-125 P

torque pulse width, usec 850
mean 52
sigma

bumper to bumper time, usec

fwd: min 71341.1
max 71346.5
mean 71342.9
sigma 0.8
rev: min 71340.5
max 71344.5
mean 71342.9
sigma 0.7
combine: mean 71342.9
sigma 0.8
scan period, usec 142685.7

71343 +-0.8
<2.9 P P P

142686 +-1.6

scan rate var, percent
fwd: min -0.003
max 0.005
rev: min -0.003
max 0.002

Tested by

QA

NO. REQ'D = 22

ORIGINAL PAGE IS
OF POOR QUALITY

000data collection;1:tapeAT-FM;trk1;file4;rev121680

Temperatures and Voltages

Ch	Scanner Out	Device	Cal	Measurement
4	2.0109E 03	SMA -Z	1	24.887 Deg C
2	9.1176E 03	MF(-Z-X)	3	24.056 Deg C
3	9.1141E 03	MF(+Z-X)	3	24.083 Deg C

: 030981 Time: 1624

SMA Designation: F-1 ACCEPT TEST

Serial Number: 4

Run Number: 30981.1624

Test Flow Event: R

Test Number: 18

Sequence Number: 6

Pressure: 1.30E 00 TORR

INITIALIZE

Words Transferred: 4

Word Number 0: INTERRUPT (Raw 177771 Octal)

Bit	Description	Setting
0	Panel Mode	1
1	Calibrate Mode	0
2	Scan Mode	0

Word Number 1: PANEL STATUS (Raw 042402 Octal)

Bit	Description	Setting
0	Bumper SW On	0
1	Beq SAM P0/P3	1
2	Beq SAM P2/P5	0
3	Beq SAM PA/PB	0
45	Processed SAM	1
45	Raw SAM	0
45	SAM 1 or SAM 2	0
45	SAM 3 (CAL SAM)	0
6	Single Reset	0
7	End SAM P0/P3	0
8	End SAM P2/P5	1
9	End SAM PD/PE	0
10	Ext Reset	1
11	5 Facet	0
12	Calibrate Mode	0
13	Scan Mode	0
14	Initialize Mode	1
15	Slow Telemetry Mode	0

Word Numbers 2 and 3: (Raw 000000 007157 Octal)

Scan Count Preset:	7157 Octal	No. of Scans:	400
Time Count Preset:	0000000	No. of Samples:	0

Number of Scans of S\$ Dimension: 400

Dimension of S\$ Array: 15226

Dimension of W\$ Array: 800

CALIBRATE: SAM/SME: 2

Facet	IFAR Counts	Preset Angles	No. a, b
P0P5	0.00	-6.7182000E-02	1.6392000E 05
P1P4	163920.00	0.0000000E 00	2.4421805E 06
P2P3	327840.00	6.7159700E-02	-2.4095374E 04

K = 0.500000

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OF POOR QUALITY

Col	Measurement	Col	Measurement
00	ERROR	00	ERROR
01	2265.400 nAmps	01	2265.400 nAmps
02	31.040 nAmps	02	31.040 nAmps
03	93.240 nAmps	03	93.240 nAmps
04	24.880 Deg C	04	24.880 Deg C
05	26.020 Deg C	05	26.020 Deg C
06	26.165 Deg C	06	26.165 Deg C
07	25.535 Deg C	07	25.535 Deg C
08	26.152 Deg C	08	26.152 Deg C
09	30.567 Deg C	09	30.567 Deg C
10	37.020 Deg C	10	37.020 Deg C
11	7.080 Volts	11	7.080 Volts
12	24.037 Deg C	12	24.037 Deg C
13	24.075 Deg C	13	24.075 Deg C
14	0.252 Volts	14	0.252 Volts
15	4.348 Volts	15	4.348 Volts
16	ERROR	16	ERROR
17	0.191 Volts	17	0.191 Volts
18	28.891 Volts	18	28.891 Volts
19	-28.832 Volts	19	-28.832 Volts

=====

IF 'ERROR 00' OCCURS DURING MARKING OF TAPE:

type:to REMARK---press execute---press continue

=====

Data Tape Identifier:	F1D8
Tape: to: Date:	0
Init Col Data File Number:	13
Scan Data File Number:	14

ORIGINAL PAGE IS
OF POOR QUALITY

TS 32015-004
8 March 1980

DATA SHEET 4.3.6-3
OPERATIONAL PERFORMANCE
ALONG SCAN GEOMETRIC REPEATABILITY

SAN KIDE (and calibrated)

SAN (1) or (2) 2

Voltage: High —, Nom —, Low —

SMA Designation F-1 ACCEPT TEST S/N 4

IFAR COLLECTS:

CALIBRATION

BUMPER A
P2 P3

GRID - P1 P4
P5 P6

BUMPER B

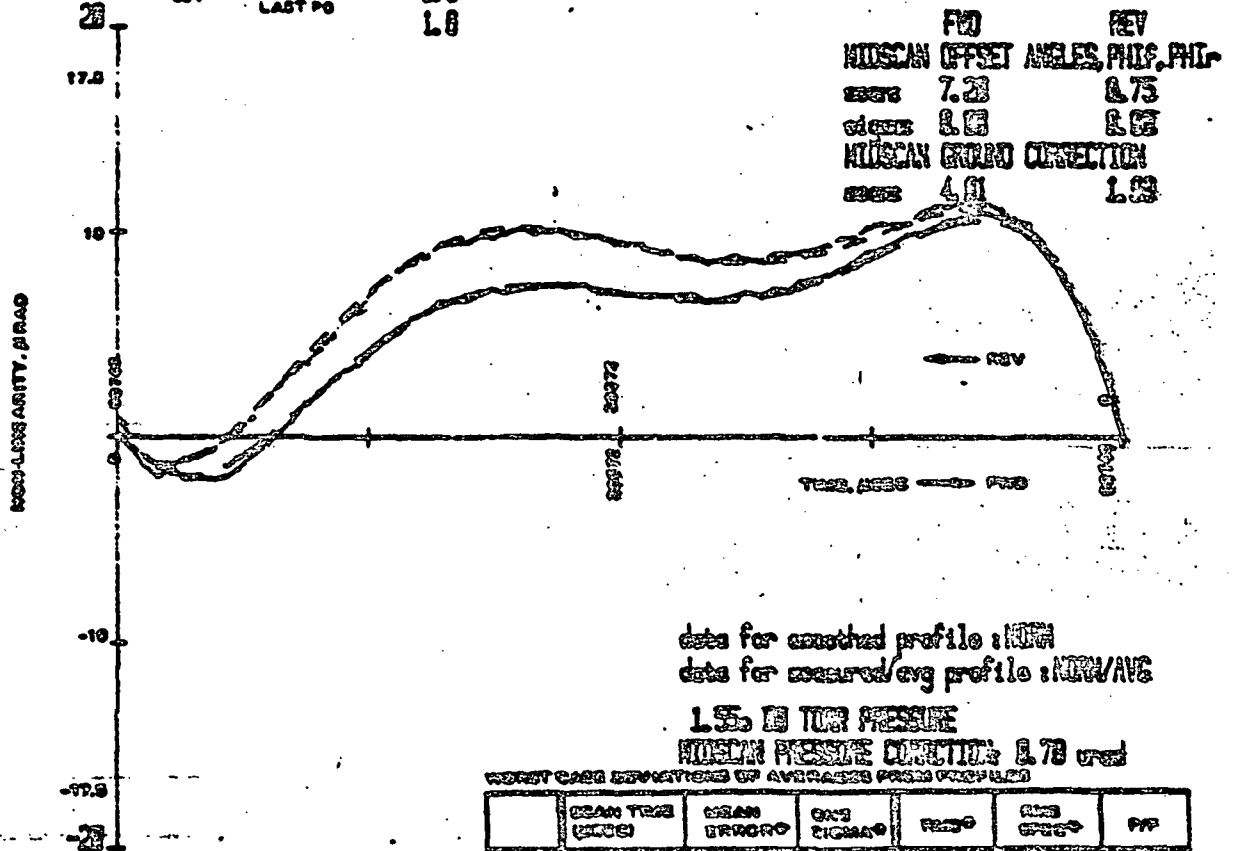
SCANNING

SAN OFFSETS, μ RAD

MEAN VALUES
P2 2.8 P3 -1.8
P1 3.1 P4 -1.3
P5 1.7 P6 0.5
LAST P6 1.8

TEMP: T1 T2 T3 T4 T5 T6 T7 T8 T9 T10
28.1 24.8 25.5 25.9 28.1 27.8 31.8 24.8 24.8
SAM ANGLE
USSD (MRAD) -67.182 67.182

AND SMOOTHED PROFILE
FROM FROM RUN NO. 32015-004
REV SMOOTHED PROFILE
MEASURED AVG. PWD
MEASURED AVG. REV



data for smoothed profile: μ RAD
data for measured/avg profile: μ RAD/AVG

1.55 IN TOR PRESSURE

MIDSCAN PRESSURE CORRECTION: 1.78 μ RAD

Worst Case Deviations of Averages from Profiles

	MEAN TIME (μ SEC)	MEAN ERROR	ONE SIGMA	TIME	ONE SIGMA	PP
FWD	1.48	-1.92	1.48	1.42		
REV	40119.33	-1.41	1.33	1.54	41.75	P

Run No. 32015.1651

Test Flow Event R-28 eq 6

Comments test no. 27.19 FWD/REV SCAN 75% each

QA Stamp

Date

32015

Tested By

ORIGINAL PAGE 18
OF POOR QUALITY

TS 32015-004
8 March 1980

DATA SHEET 4.3.5-3
OPERATIONAL PERFORMANCE
ALONG SCAN GEOMETRIC REPEATABILITY

SAW MODE (and calibrated) deviation profile

SSE (1) or (2) 2

Voltage: High _____, Nom _____, Low _____

SMA Designation F-1 ACCEPT TEST S/N 4

IPAR COUNTS:

CALIBRATION

BUMPER A

P2 P3

MID - P1 P4

P8 P9

BUMPER B

SCANNING

SAM OFFSETS, μ RAD

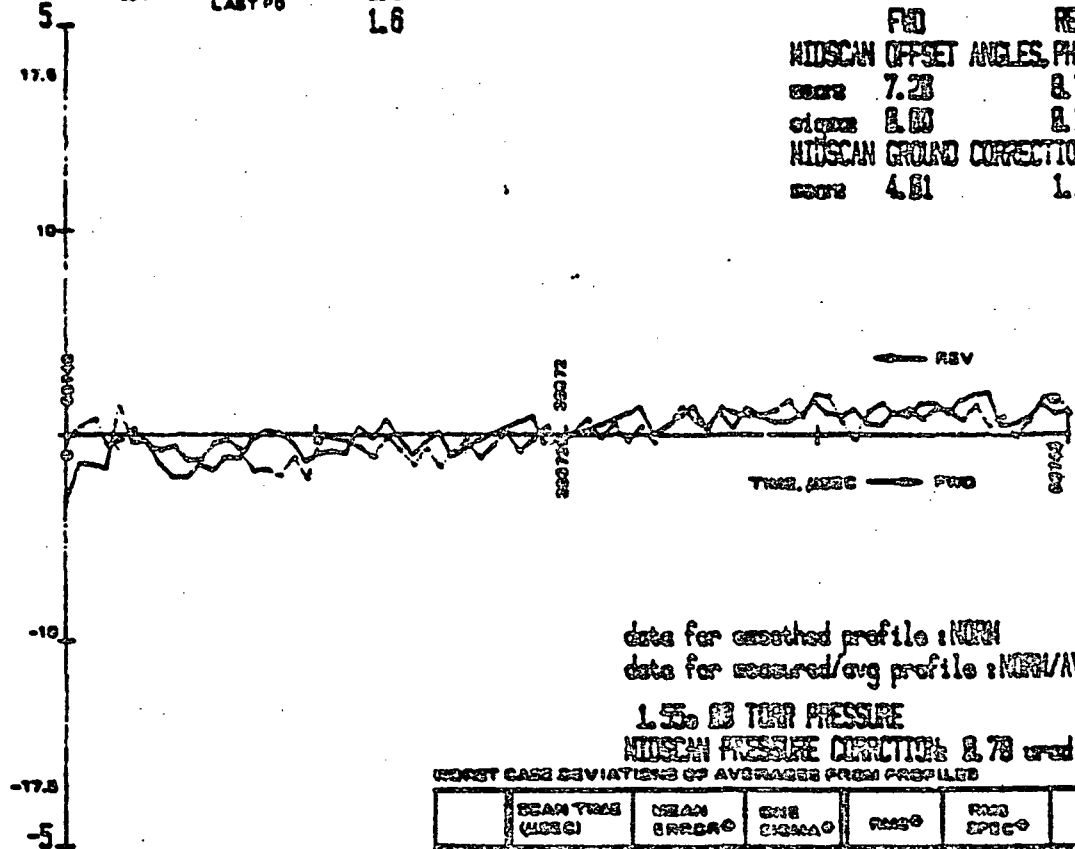
MEAN VALUES	P2	2.6	P3	-1.6
	P1	3.1	P4	-1.3
	P0	1.7	P8	0.5
			LAST P0	1.6

TEMP: T1 T2 T3 T4 T5 T6 T7 T8 T9
28.1 24.0 25.5 25.9 28.1 27.8 31.8 24.0 24.0
SAM ANGLES USED (MRAD) -67.182 67.183

PWD SMOOTHED PROFILE
(FROM TPE-4 RUN NO. 220,100)
REV SMOOTHED PROFILE
MEASURED AVG, PWD
MEASURED AVG, REV

	FWD	REV
MIDSCAN OFFSET ANGLES, PHIP, PHIR		
error	7.28	8.75
sigma	1.00	1.00
MIDSCAN GROUND CORRECTION		
error	4.61	1.93

NON-LINEARITY, μ RAD



data for smoothed profile: NORM
data for measured/avg profile: NORM/AVG

1.5% 02 THER PRESSURE

MIDSCAN PRESSURE CORRECTION: 0.78 used

Worst Case Deviations of Averages from Profiles

	SCAN TIME (μSEC)	MEAN ERROR	ONE SIGMA	RMS	RMS EPIC	P/P
PWD	1.00	-1.12	1.00	1.12		
REV	46119.36	-1.41	1.36	1.54	<1.70	P

0 MICROBAMM

Run No. 30991.1651

QA Stamp _____ Date 3/23/80

Test Flow Event R-28 eq 6

Tested By _____

Comments test no. 28.19 FWD/REV SCAN 75pts each

TS 32015-004
8 March 1980

DATA SHEET 4.2.64
OPERATIONAL PERFORMANCE
CROSS SCAN REPEATABILITY

SMA Designation F-1 ACCEPT TEST S/N 4 SAM NAME (1) of (2) 2

Voltage: High ☒ , Nom ☐ , Low ☐

FORWARD LINEAR (PAR-ALIGNMENT
TERM REMOVED):

95.53 used

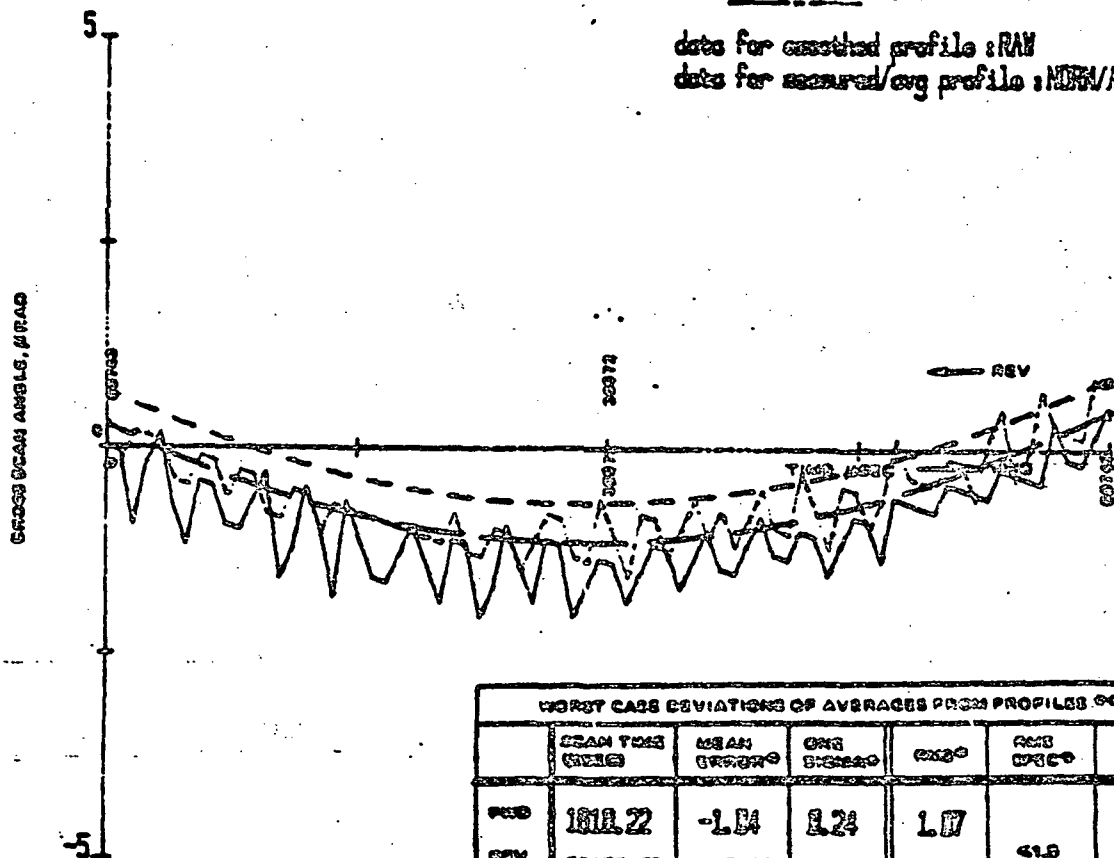
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28.9 -28.8 7.1

(FROM TPE-P RUN NO.

— FWD SMOOTHED PROFILE
— (FROM TPE-P RUN NO. 153)
— REV SMOOTHED PROFILE
— MEASURED AVG. FWD
— MEASURED AVG. REV

data for smoothed profile : RAW
data for measured/avg profile : MEAS/AVG



WORST CASE DEVIATIONS OF AVERAGES FROM PROFILES 60						
	SCAN TIME	MEAN ERROR	ONE SIGMA	TWO SIGMA	REIS SPEC	P/P
FWD	1812.2	-1.14	1.24	1.17		P
REV	2912.12	-1.13	1.15	1.15	41.5	

FREQUENCY:

1.53% ☒

0 MICRORADIANS
60 AFTER REMOVING THE LINEAR
(PAR-ALIGNMENT TERM THAT WAS REMOVED
FROM THE ORIGINAL PROFILE

Run No. 30081.1651

Test Flow Event R-23 seq 6

Comments test no. 23

QA Stamp _____ Date 3/8/81

Tested By _____

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data collection: litapeAT-FM:trk0:file4:rev022791

=====TEST INITIAL CONDITIONS=====

- (1) Fans must be off for at least 20 min.
- (2) Both Lasers must be on at least 45 min
- (3) DTS temp (+Z-X) must be +/-1 deg from (-Z-X)
- (4) Chamber pressure must be less than 2 torr
- (5) Cross axis polarity correct

=====

Temperatures and Voltages

Ch	Scanner Out	Device	Cal	Measurement
4	2.0178E 03	SMA -Z	1	24.807 Deg C
12	9.1243E 03	MF(-Z-X)	3	24.003 Deg C
13	9.1203E 03	MF(+Z-X)	3	24.035 Deg C

Date: 030981 Time: 1651

SMA Designation: F-1.ACCEPT TEST
 Serial Number: 4
 Run Number: 30981.1651
 Test Flow Event: R
 Test Number: 20
 Sequence Number: 6

INITIALIZE Words Transferred: 4

Word Number 0: INTERRUPT (Raw 177771 Octal)

Bit	Description	Setting
0	Panel Mode	1
1	Calibrate Mode	0
2	Scan Mode	0

Word Number 1: PANEL STATUS (Raw 042402 Octal)

Bit	Description	Setting
0	Bumper SW On	0
1	Beq SAM P0/P3	1
2	Beq SAM P2/P5	0
3	Beq SAM PA/PB	0
45	Processed SAM	1
45	Raw SAM	0
45	SAM 1 or SAM 2	0
45	SAM 3 (CAL SAM)	0
6	Single Reset	0
7	End SAM P0/P3	0
8	End SAM P2/P5	1
9	End SAM PD/PE	0
10	Ext Reset	1
11	5 Facet	0
12	Calibrate Mode	0
13	Scan Mode	0
14	Initialize Mode	1
15	Slow Telemetry Mode	0

Word Numbers 2 and 3: (Raw 176747 057730 Octal)

Scan Count Preset:	7730 Octal	No. of Scans:	39
Time Count Preset:	3757165	No. of Samples:	75

Number of Scans of S# Dimension: 41
 Scans x Samples: 3075
 Number of Samples plus 1: 76
 Dimension of S# Array: 14950
 82

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-----P0P5-----
Along Cross A-Octal-B
Avg 0.00 -0.00 Minutes: 1012.15
Sigma 0.00 0.42

-----BUMPER B-----

Along Cross A-Octal-B
Avg -3133.00 -2.35 Minutes: 1012.53
Sigma 0.00 0.49

-----P1P2-----

Along Cross A-Octal-B
Avg 164240.49 114.43 Minutes: 1012.82
Sigma 0.50 0.80

-----BUMPER A-----

Along Cross A-Octal-B
Avg 331988.00 238.00 Minutes: 1013.25
Sigma 0.00 0.00

-----P2P3-----

Along Cross A-Octal-B
Avg 328429.00 238.54 Minutes: 1013.43
Sigma 0.00 0.71

-----P0P5-----

Along Cross A-Octal-B
Avg 0.00 -2.02 Minutes: 1014.05
Sigma 0.00 0.98

Along Scan Calibration
Time at end of Cal: 1654.03

Facet	IFAR Counts	Preset Angles	No. a,b
P0P5	0.00 -2.02	-6.7182000E-02	1.6424049E 05
P1P4	164240.49 113.16	0.0000000E 00	2.4465680E 06
P2P3	328429.00 237.90	6.7159700E-02	-1.0388250E 03

K = 0.500079

Bumper A: 331988.00
Bumper B: -3133.00

CROSS SCAN conversion factor: 0.409urad/IFAR count
CROSS AXIS THERM DRIFT RATE: 0.42urad/min
CROSS SCAN linear term desired: 98.14urad

Data collection: 2;tapeAT-FM;trk0;file5;rev22681

Time at end of SCAN: 1654.55 1014.92
Time between Cal and Scan: 0.52min
CROSS AXIS DRIFT (last P2 to SCAN): -0.22urad
CROSS AXIS REFERENCE OFFSET: -1.05urad

1014.55

Data Type Identifier:	FID8
Track for Data:	1
Init/Cal Data File Number:	4
Scan Data File Number:	3
Norm/Avg Scan Data File Number:	6

 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. 101. 102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122. 123. 124. 125. 126. 127. 128. 129. 130. 131. 132. 133. 134. 135. 136. 137. 138. 139. 140. 141. 142. 143. 144. 145. 146. 147. 148. 149. 150. 151. 152. 153. 154. 155. 156. 157. 158. 159. 160. 161. 162. 163. 164. 165. 166. 167. 168. 169. 170. 171. 172. 173. 174. 175. 176. 177. 178. 179. 180. 181. 182. 183. 184. 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198. 199. 200. 201. 202. 203. 204. 205. 206. 207. 208. 209. 210. 211. 212. 213. 214. 215. 216. 217. 218. 219. 220. 221. 222. 223. 224. 225. 226. 227. 228. 229. 230. 231. 232. 233. 234. 235. 236. 237. 238. 239. 240. 241. 242. 243. 244. 245. 246. 247. 248. 249. 250. 251. 252. 253. 254. 255. 256. 257. 258. 259. 260. 261. 262. 263. 264. 265. 266. 267. 268. 269. 270. 271. 272. 273. 274. 275. 276. 277. 278. 279. 280. 281. 282. 283. 284. 285. 286. 287. 288. 289. 290. 291. 292. 293. 294. 295. 296. 297. 298. 299. 300. 301. 302. 303. 304. 305. 306. 307. 308. 309. 310. 311. 312. 313. 314. 315. 316. 317. 318. 319. 320. 321. 322. 323. 324. 325. 326. 327. 328. 329. 330. 331. 332. 333. 334. 335. 336. 337. 338. 339. 340. 341. 342. 343. 344. 345. 346. 347. 348. 349. 350. 351. 352. 353. 354. 355. 356. 357. 358. 359. 360. 361. 362. 363. 364. 365. 366. 367. 368. 369. 370. 371. 372. 373. 374. 375. 376. 377. 378. 379. 380. 381. 382. 383. 384. 385. 386. 387. 388. 389. 390. 391. 392. 393. 394. 395. 396. 397. 398. 399. 400. 401. 402. 403. 404. 405. 406. 407. 408. 409. 410. 411. 412. 413. 414. 415. 416. 417. 418. 419. 420. 421. 422. 423. 424. 425. 426. 427. 428. 429. 430. 431. 432. 433. 434. 435. 436. 437. 438. 439. 440. 441. 442. 443. 444. 445. 446. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819. 820. 821. 822. 823. 824. 825. 826. 827. 828. 829. 830. 831. 832. 833. 834. 835. 836. 837. 838. 839.

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| Line | Word | Address | Value | Count | Time (usec) |
|------|--------|---------|-------------|------------|--------------|
| 8 | SHSERR | N-1 | 000 011 | -4118 | -776.04 |
| 10 | FHSERR | N-1 | 377 370 | -6 | -1.70 |
| 13 | SUMERR | N-1 | 377 357 352 | -4118 | -776.04 |
| 15 | SONCTR | | 000 131 | | |
| 17 | SONLIN | N-1 | 130 | 88 | 16.58 |
| 18 | TRNERR | N-1 | 004 070 | 1080 | 203.53 |
| 20 | TORPLS | N-1 | 360 161 | -3963 | -750.60 |
| 22 | SHSERR | N-2 | 377 367 | -9 | -1.70 |
| 24 | FHSERR | N-2 | 000 006 | 6 | 1.13 |
| 27 | SUMERR | N-2 | 377 360 164 | -3980 | -750.03 |
| 30 | SONTYM | N-2 | 004 353 034 | 322332 | 60743.58 |
| 32 | NSCANS | | 037 | No.Scans = | 31 (decimal) |

Scan N: 38 no. of words transferred = 192

Line Length: N-1: 000 257 372 377
 Active Scan Time: N-1: 60742.25
 Final Time: N: 60743.48

TELEMETRY

| Byte No | Name | Contents | Pulses | Time (usec) |
|---------|------------|-------------|----------------------------|--------------|
| 1 | SYNC | 246 | | |
| 2 | OPSTAT N | 306 | Bit 7 = 1: Scan N= Reverse | |
| 3 | SONLIN N | 250 | -88 | -16.58 |
| 4 | TRNERR N | 001 042 | 290 | 54.65 |
| 6 | TORPLS N | 357 357 | -4113 | -775.10 |
| 8 | SHSERR N-1 | 000 012 | 10 | 1.88 |
| 10 | FHSERR N-1 | 377 372 | -6 | -1.13 |
| 13 | SUMERR N-1 | 377 357 354 | -4116 | -775.66 |
| 15 | SONCTR | 000 153 | | |
| 17 | SONLIN N-1 | 130 | 88 | 16.58 |
| 18 | TRNERR N-1 | 004 070 | 1080 | 203.53 |
| 20 | TORPLS N-1 | 360 166 | -3979 | -749.66 |
| 22 | SHSERR N-2 | 377 373 | -5 | -0.94 |
| 24 | FHSERR N-2 | 000 011 | 9 | 1.70 |
| 27 | SUMERR N-2 | 377 360 163 | -3981 | -750.22 |
| 30 | SONTYM N-2 | 004 353 025 | 322325 | 60742.26 |
| 32 | NSCANS | 037 | No.Scans = | 31 (decimal) |

Scan N: 39 no. of words transferred = 181

Line Length: N-1: 377 220 006 000
 Active Scan Time: N-1: 60743.19
 Final Time: N: 60743.30

TELEMETRY

| Byte No | Name | Contents | Pulses | Time (usec) |
|---------|------------|-------------|----------------------------|--------------|
| 1 | SYNC | 246 | | |
| 2 | OPSTAT N | 106 | Bit 7 = 0: Scan N= Forward | |
| 3 | SONLIN N | 130 | 88 | 16.58 |
| 4 | TRNERR N | 004 071 | 1081 | 203.71 |
| 6 | TORPLS N | 360 163 | -3981 | -750.22 |
| 8 | SHSERR N-1 | 377 371 | -7 | -1.32 |
| 10 | FHSERR N-1 | 000 006 | 6 | 1.13 |
| 13 | SUMERR N-1 | 377 360 165 | -3979 | -749.84 |
| 15 | SONCTR | 000 153 | | |
| 17 | SONLIN N-1 | 250 | -88 | -16.58 |
| 18 | TRNERR N-1 | 001 042 | 290 | 54.65 |
| 20 | TORPLS N-1 | 357 357 | -4113 | -775.10 |
| 22 | SHSERR N-2 | 000 012 | 10 | 1.88 |
| 24 | FHSERR N-2 | 377 372 | -6 | -1.13 |
| 27 | SUMERR N-2 | 377 357 354 | -4116 | -775.66 |
| 30 | SONTYM N-2 | 004 353 025 | 322325 | 60742.26 |
| 32 | NSCANS | 037 | No.Scans = | 31 (decimal) |

TELETYPE PRINTOUT: 2; tape AT-F, title, file 16, rev 22381

Date: 030981 Time: 1651

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SCN Description: F-1 ACCEPT TEST
 Serial Number: 1
 Run Number: 30981.1651
 Test Flow Event: R
 Test Number: 20
 Sequence Number: 6

data tape identifier: F1D8
 track for data: 1
 INIT-CLL data file number: 4
 SCAN data file number: 5
 NORM-AVG SCAN data file number: 6
 Smoothing Coeffs file number: 0

mode selected: NORM-AVG

TELEMETRY PRINTOUT: 2; tape AT-F, title, file 16, rev 22381

Data Date: 030981 Data Time: 1651

SAM MODE operation

scan N: 1 no. of words transferred = 187

Line Length, N-1: 377 160 006 000
 Active Scan Time, N-1: 60743.57
 Final Time, N: 60743.11

TELEMETRY

| Byte No | Name | Contents | Pulses | Time(μsec) |
|---------|------------------|-------------|----------------------------|---------------|
| 1 | SYNCR | 006 | | |
| 2 | OPSTAT N | 106 | Bit 7 = 0: Scan N= Forward | |
| 3 | SCNLIN N | 130 | 88 | 16.58 |
| 4 | 5 TRNERR N | 004 070 | 1080 | 203.53 |
| 6 | 7 TORPLS N | 360 161 | -3983 | -750.60 |
| 8 | 9 SHSERR N-1 | 377 367 | -9 | -1.70 |
| 10 | 11 FHSERR N-1 | 003 006 | 6 | 1.13 |
| 12 | 13 14 SUMERR N-1 | 377 360 164 | -3980 | -750.03 |
| 15 | 16 SCNCTR | 000 130 | | |
| 17 | 17 SCNLIN N-1 | 250 | -88 | -16.58 |
| 18 | 19 TRNERR N-1 | 001 041 | 289 | 54.46 |
| 20 | 21 TORPLS N-1 | 357 354 | -4116 | -775.66 |
| 22 | 23 SHSERR N-2 | 000 010 | 8 | 1.51 |
| 24 | 25 FHSERR N-2 | 377 370 | -8 | -1.51 |
| 26 | 27 28 SUMERR N-2 | 377 357 354 | -4116 | -775.66 |
| 29 | 30 31 SCNTYM N-2 | 004 353 031 | 322329 | 60743.01 |
| 32 | NSCANS | 162 | No.Scans = | 114 (decimal) |

scan N: 2 no. of words transferred = 182

Line Length, N-1: 000 237 370 377
 Active Scan Time, N-1: 60742.81
 Final Time, N: 60742.92

TELEMETRY

| Byte No | Name | Contents | Pulses | Time(μsec) |
|---------|----------|----------|----------------------------|------------|
| 1 | SYNCR | 346 | | |
| 2 | OPSTAT N | 306 | Bit 7 = 1: Scan N= Reverse | |
| 3 | SCNLIN N | 350 | 88 | -16.58 |

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Appendix B

Scan Mirror Assembly Acceptance Test Data

Part 10

Test Flow Event H

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DATA SHEET 4.3.4-1
SCAN PROFILES
ALONG SCAN

TS 32015-004
8 March 1980

SMA Designation F-1 ENG DATA
T2 T3 T4 T5 T6 T7 T8 T9
25.6 24.6 24.8 25.2 24.8 26.3 29.2 24.4 24.4

SAW MODE
S/N 4

SME (1) or (2) 1 28.9-28.9 7.1
(Nominal Voltage)

SCAN ANGLES
USED (MRAD) -57.171 57.153

IPAR COUNTS K- 1.570691

PAST SCAN

DUMPER A 3527
P2 P3 328379 328385 328392
MID P1 P4 184218 184233 184223
P6 P8 -2 4 4
DUMPER B -3215 5

OFFSET-CORRECTED SCAN ANGLES (REF P0), MRAD:

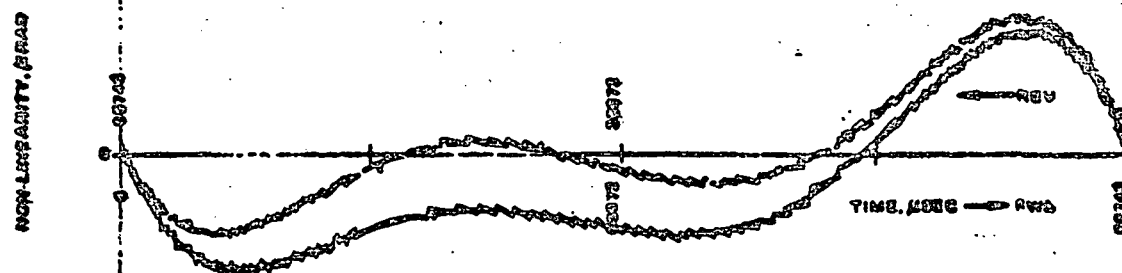
P2 134330 P3 134329
P1 57174 P4 57170
P6 8 P8 8
NEXT P0 8

| ORDER (1) | PWD | REV | SPEC | P/P |
|-------------------------|-------------|-------------|------|-----|
| 8 | 4.6812-07 | 0.1533-09 | | |
| 1 | -1.6927-03 | 2.5213-03 | | |
| 2 | 2.4555-01 | -1.6002-01 | | |
| 3 | -1.1842-01 | 1.3325-01 | | |
| 4 | 2.1348-02 | -2.3212-02 | | |
| 5 | -1.4533-03 | 1.4747-03 | | |
| INFLECTION
POINTS | 3 | 3 | | P |
| MAX+
MAX - | 0.8
-5.5 | 0.8
-3.9 | 17.9 | P |
| AVERAGED
TO SMOOTHED | 0.2 | 0.2 | 0.1 | P |

5.53-01 TORR PRESSURE
MIDSCAN PRESSURE CORRECTION 0.28 URAD

SAW OFFSET, URAD

23 1.1
0.8 1.9
2.6 2.6



==== PWD SMOOTHED
==== REV SMOOTHED
==== PWD MEASURED
==== REV MEASURED

data for smoothed profile: HORN

data for measured profile: HORN

Part No. 31031.0318

Test Flow Event H-2 seq 7

Comments test no. 2

QA Stamp _____ Date 31031

Tested By _____

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DATA SHEET 4.3.4-2
SCAN PROFILES
ALONG SCAN SMOOTHED

TS 32015-004
8 March 1980

SMA Designation F-1 ENG DATA

SAW MODE 6/N 4

SME (1) or (2) 1
(Nominal Voltage)

K = 0.500891
PWD MIDSCAN
REV MIDSCAN
NESTED MIDSCAN:
NON-NESTED MIDSCAN

-3.67
-4.81
-5.24
-5.46

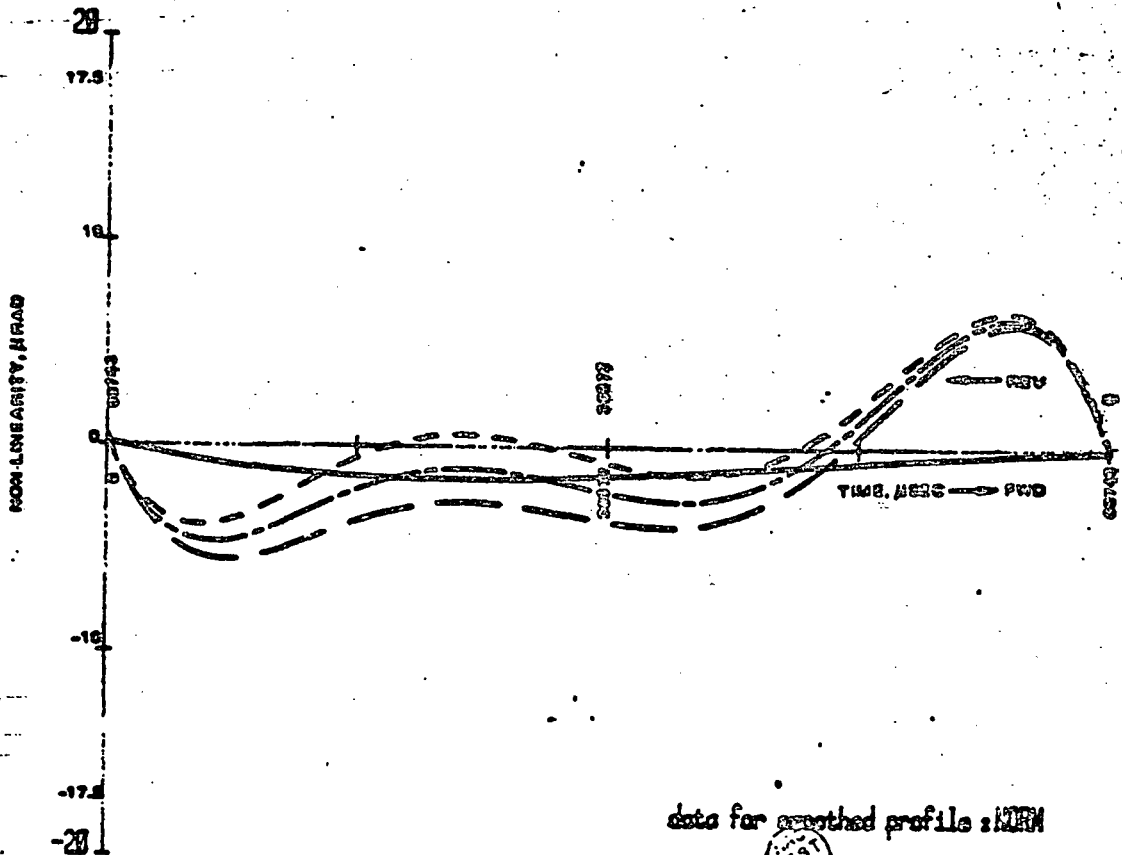
from SMOOTHED PROFILES

28.9 - 28.8 7.1

PERIOD
1st HALF
2nd HALF
PHI_{1a}
PHI_{1a}, PHI_{1b}

| | FWD | REV |
|----------------|----------|----------|
| | 63743.00 | 63743.00 |
| T ₁ | 33376.49 | 33337.63 |
| T ₂ | 33388.51 | 33375.37 |
| | -5.18 | -2.71 |
| | -5.46 | -2.43 |

==== PWD SMOOTHED
==== REV SMOOTHED
==== NESTED SMOOTHED
==== NON-NESTED SMOOTH



data for smoothed profile: 12/11/80

Run No. 31081.0918

QA Stamp

Date 31081

Test Flow Event H-2 eq 7

Tested By

Comments test no. 2 1 FWD/1 REV SCAN 400pts each

NO. REQ'D
VOLUME

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DATA SHEET 4.3.4.3
SCAN PROFILES
BAND TO BAND REGISTRATION

TS 32015-006
8 March 1980

SMA Designation F-1 ENG DATA

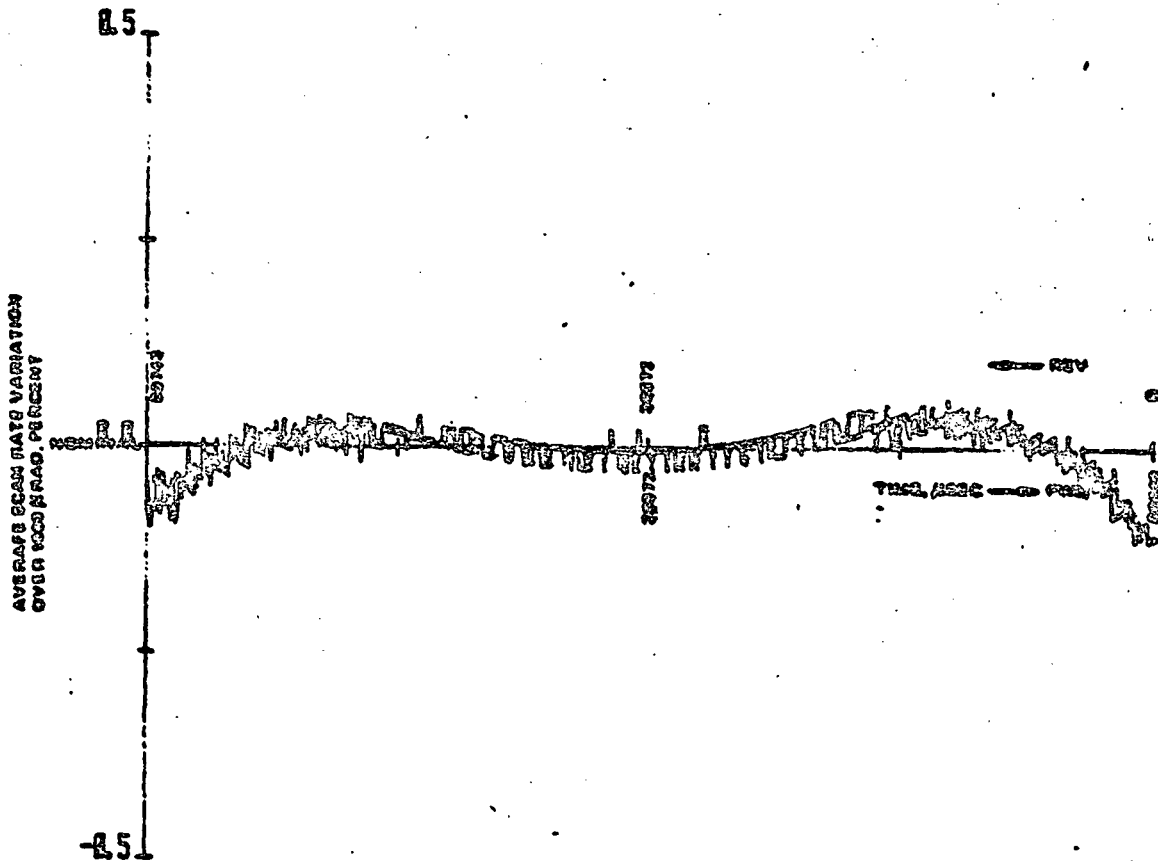
SAW MODE S/N 4

TIME (1) or (2)
(Nominal Voltage)

BAND SEPARATION = 75.8 IFDV (1878.2 μ RAD) 28.9-28.9 7.1

| | PWG | RGV | GPS | P/P |
|--|-------|-------|---------|-----|
| PEAK AVG SCAN RATE | 0.112 | 0.112 | | |
| AVG SCAN RATE
(90% OF SCAN)
LESS THAN: | 0.044 | 0.044 | ← .0247 | P |

PD
REV



data used for computations = RAV

Run No. 31091.0318

Test Flow Event H-2

Comments test no. 2

QA Stamp

Tested By

Date

3/10/81

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DATA SHEET 4.14-4
SCAN PROFILES
CROSS SCAN

TS 32015-004
8 March 1980

33

SMA Designation F-1 ENG DATA

SCAN MODE

S/N

SME (1) or (2)

28.9-28.8.7.1

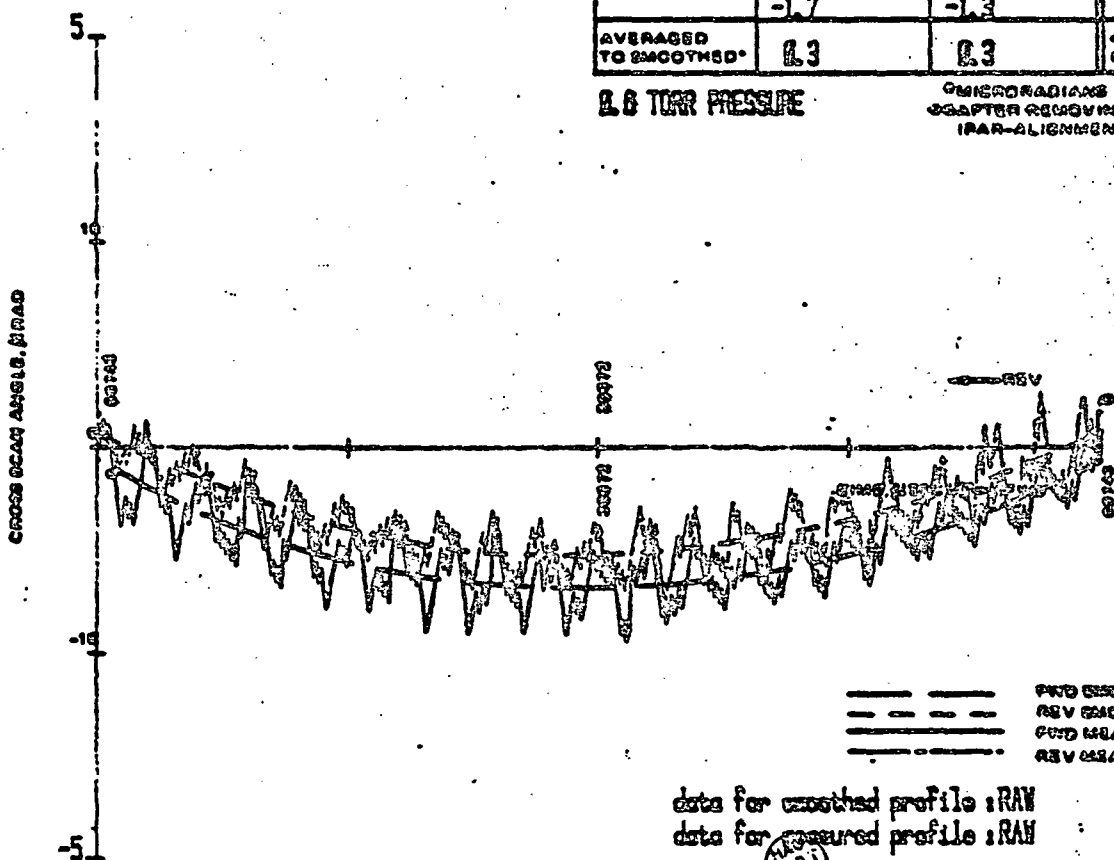
FORWARD LINEAR TERM
REMOVED TO CORRECT FOR
IPAR ALIGNMENT (REV TERM)
--PWD TERM: 82.78 urod

SMOOTHING POLYNOMIAL COEFFICIENTS

| ORDER (I) | PWD | REV | SPC | P.T. |
|-------------------------|--------------|-------------|--------------|------|
| 0 | -1.4483-87 | 1.8333-87 | | |
| 1 | -1.2522-84 | -2.8974-85 | | |
| 2 | 3.5212-83 | 2.8335-83 | | |
| 3 | -4.8330-82 | -2.8335-82 | | |
| 4 | 5.4478-81 | 1.4523-81 | | |
| 5 | -2.3877-80 | -0.8463-80 | | |
| INFLECTION
POINTS | 0 | 1 | < | P |
| MAX -
MIN - | -2.1
-1.7 | 0.2
-1.3 | -
- | P |
| AVERAGED
TO SMOOTHED | 0.3 | 0.3 | <0.3
READ | P |

0.8 TORR PRESSURE

OMICRORADIANS
AFTER REMOVING LINEAR
IPAR-ALIGNMENT TERM



Run No. 31291.0918

Test Flow Event H-2 seq 7

Comments test no. 2

QA Stamp

Date 31001

Tested By

NO. REQ'D -
VOLUME

ORIGINAL PAGE IS
OF POOR QUALITY

TS 32015-004
8 March 1980

DATA SHEET 4.3.4-B
SCAN PROFILES
CROSS SCAN

SMA Designation F-1 ENG DATA

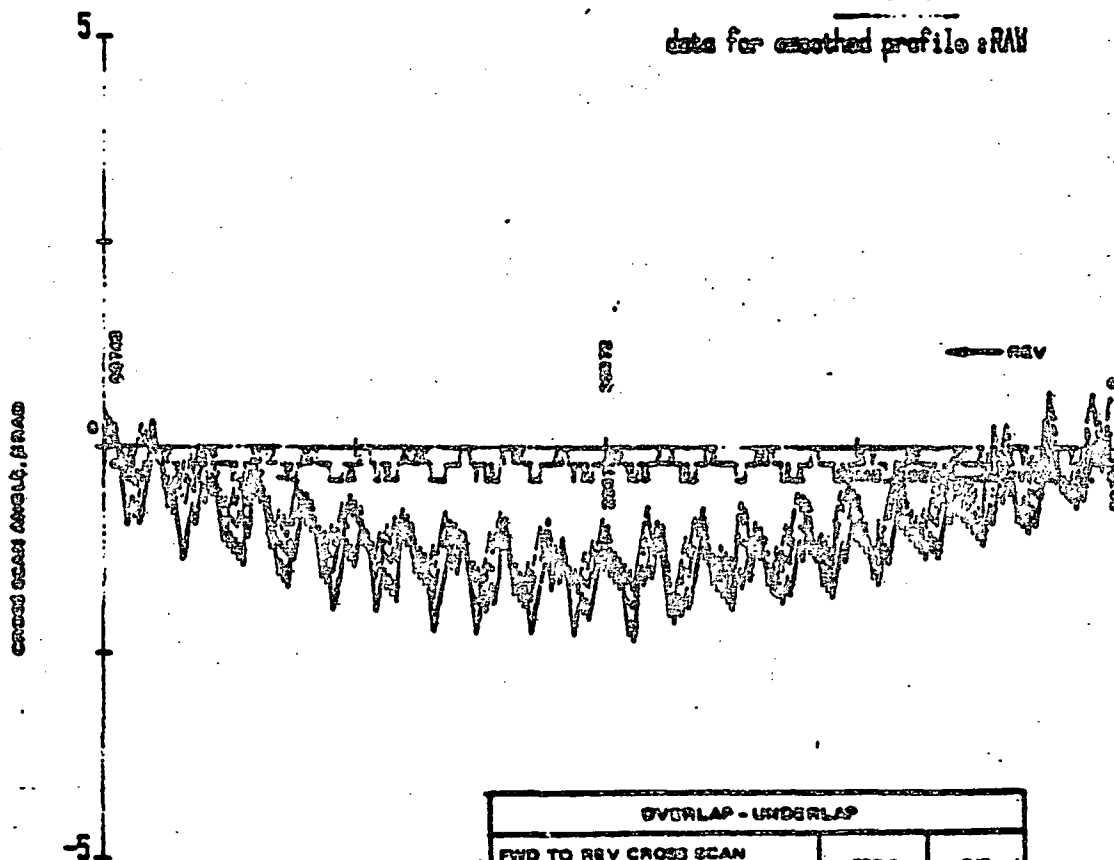
SAN 1005N 4

SME (1) or (2) 1
(Nominal Voltages)

28.9-28.8 7.1

_____ FWD MEASURED
_____ REV MEASURED
_____ NESTED, MEASURED
_____ NON NESTED, MEASURED

data for smoothed profile: RAW



| OVERLAP - UNDERLAP | | |
|---|--------------|----|
| FWD TO REV CROSS SCAN
PROFILE (2X NON-NESTED) μRAD | μRC | μR |
| MAX = 1.23 | 0.21
μRAD | p |

Run No. 31001.0918

Test Flow Event H-2 seq 7

Comments test no 2

QA Stamp _____ Date 31001

Tested By _____

=====TEST INITIAL CONDITIONS=====

- (1) Fans must be off for at least 30 min.
- (2) Both Lasers must be on at least 45 min
- (3) DTS temp (+Z+X) must be +/- 1 deg from (-Z-X)
- (4) Chamber pressure must be less than 2 torr
- (5) Cross axis polarity correct

ORIGINAL PAGE 13
OF POOR QUALITY

Temperatures and Voltages

| Ch | Scanner Out | Device | Cal | Measurement |
|----|-------------|-----------|-----|--------------|
| 4 | 2.0461E 03 | SMA -Z | 1 | 24.483 Deg C |
| 12 | 9.0302E 03 | MFC(-Z-X) | 3 | 24.350 Deg C |
| 13 | 9.0867E 03 | MFC(+Z+X) | 3 | 24.299 Deg C |

Date: 031081 TEST 32 Time: 0918

SMA Designation: F-1 ACCEPT TEST *END DATA* TEST 32
Serial Number: 4
Run Number: 31081.0918
Test Flow Event: H
Test Number: 2
Sequence Number: 7

INITIALIZE Words Transferred: 4

Word Number 3: INTERRUPT (Raw 177771 Octal)

| Bit | Description | Setting |
|-----|----------------|---------|
| 0 | Panel Mode | 1 |
| 1 | Calibrate Mode | 0 |
| 2 | Scan Mode | 0 |

Word Number 1: PANEL STATUS (Raw 042402 Octal)

| Bit | Description | Setting |
|-----|---------------------|---------|
| 0 | Bumper SW On | 0 |
| 1 | Beq SAM P0/P3 | 1 |
| 2 | Beq SAM P2/P5 | 0 |
| 3 | Beq SAM PA/PB | 0 |
| 45 | Processed SAM | 1 |
| 45 | Raw SAM | 0 |
| 45 | SAM 1 or SAM 2 | 0 |
| 45 | SAM 3 (CAL SAM) | 0 |
| 6 | Single Reset | 0 |
| 7 | End SAM P0/P3 | 0 |
| 8 | End SAM P2/P5 | 1 |
| 9 | End SAM PD/PE | 0 |
| 10 | Ext Reset | 01 |
| 11 | 3 Facet | 0 |
| 12 | Calibrate Mode | 0 |
| 13 | Scan Mode | 0 |
| 14 | Initialize Mode | 1 |
| 15 | Slow Telemetry Mode | 0 |

Word Numbers 2 and 3: (Raw 177633 057774 Octal)

| | | | |
|--------------------|------------|-----------------|-----|
| Scan Count Preset: | 7774 Octal | No. of Scans: | 3 |
| Time Count Preset: | 3774665 | No. of Samples: | 400 |

Number of Scans of S\$ Dimension: 3
Scans x Samples: 1200
Number of Samples plus 1: 401
Dimension of S\$ Array: 5018
Dimension of H\$ Array: 6

ORIGINAL PAGE IS
OF POOR QUALITY

Along Cross A-Octal-B

Cross Data not 4XXX

Cross Data not 4XXX

Along 1.05 -1.23 Minutes: 560.28
Sigma 0.78 0.42

-----BUMPER B-----

Along Cross A-Octal-B Minutes: 560.70
Sigma -3213.00 -3.00
Sigma 0.00 0.00

-----PIP2-----

Along Cross A-Octal-B Minutes: 560.98
Sigma 154220.65 112.90
Sigma 0.48 0.60

-----BUMPER A-----

Along Cross A-Octal-B Minutes: 561.40
Sigma 331907.00 235.50
Sigma 0.00 0.50

-----PIP3-----

Along Cross A-Octal-B Minutes: 561.62
Sigma 328381.00 234.13
Sigma 0.00 0.49

-----POP5-----

Along Cross A-Octal-B Minutes: 562.33
Sigma 0.24 -1.32
Sigma 0.43 0.47

Along Scan Calibration
Time at end of Cal: 922.20

| Facet | IFAR Counts | Preset Angles | No. a, b |
|-------|------------------|----------------|---------------|
| POP5 | 0.24 -1.32 | -6.7170900E-02 | 1.6422012E 05 |
| PIP4 | 154220.12 112.84 | 0.0000000E 00 | 2.4464174E 06 |
| PIP3 | 328380.72 234.10 | 6.7159200E-02 | 1.3625222E 04 |

K = 0.500090

Bumper A: 331906.63
Bumper B: -3213.65

CROSS SCAN conversion factor: 0.409urad/IFAR count
CROSS AXIS THERM DRIFT RATE: 0.02urad/min
CROSS SCAN linear term removed: 96.30urad

diff in K= 0.500090

-----POP5-----

Along Cross A-Octal-B Minutes: 562.92
Sigma -1.20 3.78
Sigma 0.70 0.41

-2214.74 -2.00 Minutes: 563.33
 Sigma 0.00 0.00

338

-----P1P2-----

Alone Cross A-Octal-B
 Avg 164213.00 115.16 Minutes: 563.62
 Sigma 0.00 0.37

ORIGINAL PAGE 18
OF POOR QUALITY

-----BUMPER A-----

Alone Cross A-Octal-B
 Avg 331907.00 240.00 Minutes: 564.02
 Sigma 0.00 0.00

-----P2P3-----

Alone Cross A-Octal-B
 Avg 328379.62 237.14 Minutes: 564.23
 Sigma 0.49 0.35

-----P0P5-----

Alone Cross A-Octal-B
 Avg -2.25 0.47 Minutes: 564.75
 Sigma 0.40 0.53

Alone Scan Calibration
 Time at end of Cal: 924.45

| Facet | IFAR Counts | | Preset Angles | No. a, b |
|-------|-------------|--------|----------------|---------------|
| P0P5 | -2.25 | 0.47 | -6.7170900E-02 | 1.6421841E 05 |
| P1P4 | 164218.41 | 114.96 | 0.0000000E 00 | 2.4464258E 06 |
| P2P3 | 328379.35 | 237.05 | 6.7159200E-02 | 1.3816657E 04 |

K = 0.500091

Bumper A: 331906.62
 Bumper B: -3214.74

CROSS SCAN conversion factor: 0.409urad/IFAR count
 CROSS AXIS THERM DRIFT RATE: 0.07urad/min
 CROSS SCAN linear term removed: 96.78urad

diff in K= 0.000001

data collection: 2; tape AT-FM; trk 0; file 5; rev 22681

Time at end of SCAN: 925.45 565.75
 Time between Cal and Scan: 1.00min
 CROSS AXIS DRIFT: (last P0 to SCAN): -0.07urad
 CROSS AXIS REFERENCE OFFSET: 0.12urad

Time at end of SCAN: 925.55 565.92
 Time between Cal and Scan: 1.10min
 CROSS AXIS DRIFT: (last P0 to SCAN): -0.08urad
 CROSS AXIS REFERENCE OFFSET: 0.11urad

Chamber Pressure (torr): 0.55

Temperatures and Voltages

| Ch | Scanner Out | Device | Cal | Measurement |
|----|-------------|---------|-----|-------------|
| 0 | -1.0000E 04 | QUARTER | 3 | ERROR |

ORIGINAL PAGE IS
OF POOR QUALITY

| | | | | |
|----|-------------|------------|---|---------------|
| 4 | 2.0356E 03 | SMA -Z | 1 | 24.604 Deg C |
| 5 | 1.9388E 03 | SMA -X | 1 | 25.175 Deg C |
| 6 | 1.9588E 03 | SMA +Z | 1 | 25.605 Deg C |
| 7 | 2.0182E 03 | SMA +X | 1 | 24.803 Deg C |
| 8 | 2.0170E 03 | TORQ, BRDG | 1 | 24.817 Deg C |
| 9 | 8.5464E 02 | SME TEMP | 2 | 29.189 Deg C |
| 10 | 1.9077E 03 | SAM TEMP | 1 | 26.338 Deg C |
| 11 | 7.0939E 00 | EU=6.8V | 4 | 7.094 Volts |
| 12 | 9.0753E 03 | MF(-Z-X) | 3 | 24.389 Deg C |
| 13 | 9.0770E 03 | MF(+Z+X) | 3 | 24.375 Deg C |
| 14 | 4.3356E 00 | SME(1)TEL | 4 | 4.336 Volts |
| 15 | 2.3590E-01 | SME(2)TEL | 4 | 0.236 Volts |
| 16 | -1.0000E 04 | SME PR U7 | 3 | ERROR |
| 17 | 3.8570E 00 | SAM1/BMP2 | 4 | 3.857 Volts |
| 18 | 2.8887E 01 | EU=+27V | 4 | 28.887 Volts |
| 19 | -2.8824E 01 | EU=-27V | 4 | -28.824 Volts |

Data Tape Identifier: FID8
Track for Data: 1
Init/Cal Data File Number: 7
Scan Data File Number: 8
Norm/Avg Scan Data File Number: 9
Smoothing Coeffs File Number: 10

=====

IF 'ERROR' 43 OCCURS DURNING MARKING OF TAPE:
type:sto REMARK---press execute---press continue

=====

ORIGINAL PAGE IS
OF POOR QUALITY

ELEMENT: F-104-1: tapeAT-F, trk0, file16, rev22381

Date: 031981 Time: 0918

QMA Designation: F-1 ENG DATA
Serial Number: 4
Run Number: 31081.0918
Test Flow Event: H
Test Number: 2
Sequence Number: 7

Data tape identifier: F1D8
Track for data: 1
INIT/CAL data file number: 7
SCAN data file number: 8
NORM/AVG SCAN data file number: 9
Smoothing Coeffs file number: 10

Mode selected: NORM

TELEMETRY PRINTOUT, 2: tapeAT-F, trk0, file16, rev22381

Data Date: 031981 Data Time: 0918

SAM MODE operation

Scan N: 1 no. of words transferred = 837

Line Length, N-1: 376 300 024 300
Active Scan Time, N-1: 60743.00
Final Time, N: 60743.30

TELEMETRY

| Byte No | Name | Contents | Pulses | Time(μsec) |
|----------|------------|-------------|------------------------------|------------|
| 1 | SYNC | 200 | | |
| 2 | OPSTAT N | 006 | Bit 7 = 0: Scan N= Forward | |
| 3 | SCHLIN N | 130 | 88 | 16.58 |
| 4 5 | TRNERR N | 003 241 | 929 | 175.07 |
| 6 7 | TORPLS N | 360 212 | -3958 | -745.89 |
| 8 9 | SHSERR N-1 | 377 354 | 20 | -3.77 |
| 10-11 | FHSERR N-1 | 000 024 | 20 | 3.77 |
| 12 13 14 | SUMERR N-1 | 377 360 212 | -3958 | -745.89 |
| 15-16 | SCNCTR | 000 355 | | |
| 17 | SCHLIN N-1 | 250 | -88 | -16.58 |
| 18 19 | TRNERR N-1 | 001 152 | 362 | 68.22 |
| 20 21 | TORPLS N-1 | 357 366 | -4106 | -773.78 |
| 22 23 | SHSERR N-2 | 000 024 | 20 | 3.77 |
| 24 25 | FHSERR N-2 | 000 024 | 20 | 3.77 |
| 26 27 28 | SUMERR N-2 | 377 360 212 | -3958 | -745.89 |
| 29 30 | SCNCTR | 000 355 | | |
| | | | 312329 | 60743.01 |
| | | | No. of words = 174 (decimal) | |

SG(1)

H 507

ORIGINAL PAGE IS
OF POOR QUALITY

scan #: 2 no. of words transferred = 832

Line Length: H-1: 001 377 345 377
Active Scan Time: N-1: 60743.00
Final Time: H: 60743.30

TELEMETRY

| Byte No. | Name | Contents | Pulses | Time(usec) |
|----------|------------------|-------------|----------------------------|--------------|
| 1 | SYNC | 200 | | |
| 2 | OPSTAT N | 206 | | |
| 3 | SCN LIN N | 250 | Bit 7 = 1: Scan No Reverse | |
| 4 | 5 TRNERR N | 001 152 | -88 | -16.58 |
| 6 | 7 TORPLS N | 357 366 | 362 | 68.22 |
| 8 | 9 SHSERR N-1 | 000 033 | -4106 | -773.78 |
| 10 | 11 FHSERR N-1 | 377 345 | 27 | 5.09 |
| 12 | 13 14 SUMERR N-1 | 377 357 366 | -27 | -5.09 |
| 15 | 16 SCNCTR | 000 356 | -4106 | -773.78 |
| 17 | SCN LIN N-1 | 130 | 88 | 16.58 |
| 18 | 19 TRNERR N-1 | 003 241 | 929 | 175.07 |
| 20 | 21 TORPLS N-1 | 360 212 | -3958 | -745.89 |
| 22 | 23 SHSERR N-2 | 377 354 | -20 | -3.77 |
| 24 | 25 FHSERR N-2 | 000 024 | 20 | 3.77 |
| 26 | 27 28 SUMERR N-2 | 377 360 212 | -3958 | -745.89 |
| 30 | 31 SCNTYM N-2 | 004 353 031 | 322329 | 60743.01 |
| 32 | NSCANS | 037 | No.Scans = | 31 (decimal) |

ORIGINAL PAGE IS
OF POOR QUALITY

DATA SHEET 4.3.4-1
SCAN PROFILES
ALONG SCAN

TS 32015-004
8 March 1980

SMA Designation F-1 ENG DATA

BUMPER NO. 4

SME (1) or (2) :

28.9 - 28.8 7.1
(Nominal Voltages)

T2 T3 T4 T5 T6 T7 T8 T9
25.9 24.7 25.0 25.4 25.0 26.6 22.6 24.5

SMOOTHING POLYNOMIAL COEFFICIENTS

SAN ANGLES
USED (MRAD) -67.2 67.2

IPAR COUNTS X - 0.500298

FAST SCAN

BUMPER A
P2 P3

MID P1 P4 FROM TFEG RUN 31081.0931

P0 P5

BUMPER B

OFFSET-CORRECTED SCAN ANGLES (REF P0), MRAD:

P2 P3

P1 P4

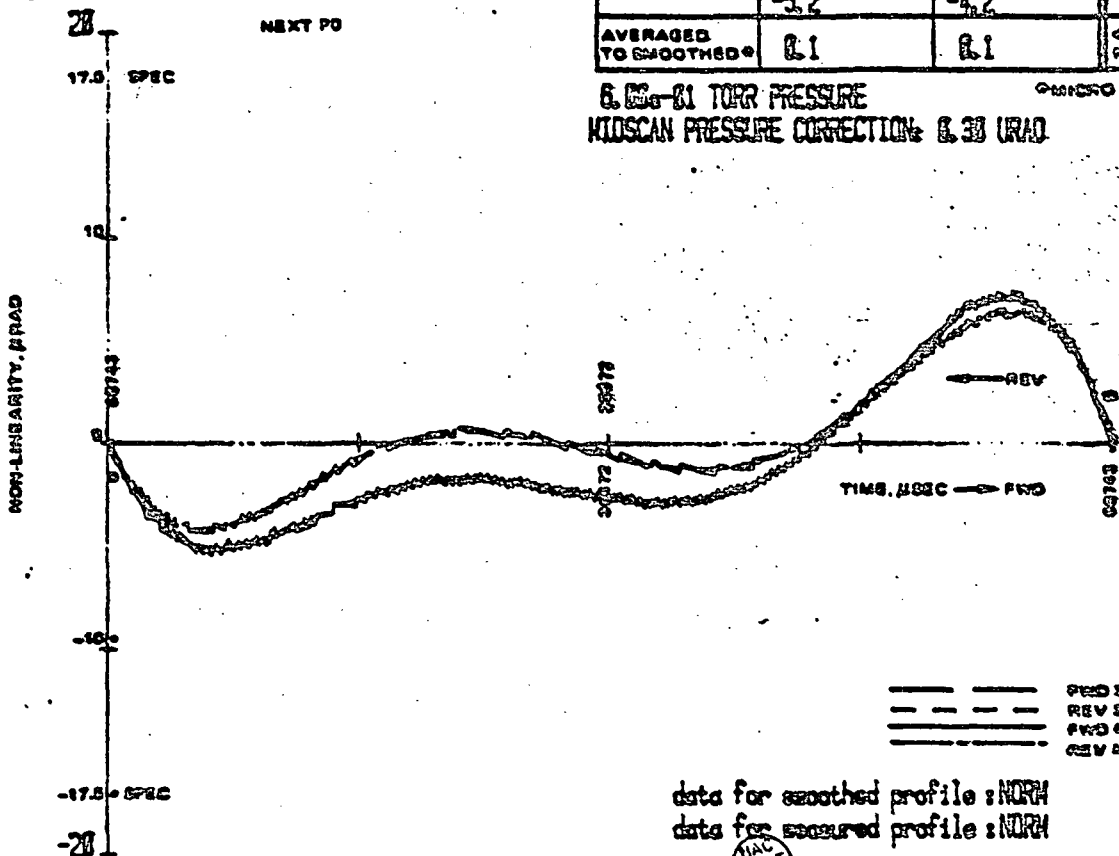
P0 P5

NEXT P0

| ORDER (T) | PWD | REV | SPEC | P/P |
|-------------------------|-------------|-------------|------------|-----|
| 0 | 5.5119-03 | -2.4379-07 | | |
| 1 | -1.9558-03 | 2.3769-03 | | |
| 2 | 2.4116-01 | -2.9430-01 | | |
| 3 | -1.1179-01 | 1.2652-01 | | |
| 4 | 2.1896-02 | -2.2760-02 | | |
| 5 | -1.5977-03 | 1.4566-03 | | |
| INFLECTION
POINTS | 3 | 3 | | |
| MAX-
MIN - | 7.1
-5.2 | 6.4
-4.2 | 17.0 | |
| AVERAGED
TO SMOOTHED | 0.1 | 0.1 | 0.1
RMS | |

6.00-01 TORR PRESSURE
MIDSCAN PRESSURE CORRECTION: 0.30 URAD

OMEGA RADIANS



data for smoothed profile: NORM
data for measured profile: NORM

Run No. 31081.0931

Test Flow Event H-3 eq 7

Comments test no. 3

QA Stamp _____ Date 31081

Tested By _____

ORIGINAL PAGE IS
OF POOR QUALITY

DATA SHEET 4.3.4-2
SCAN PROFILES
ALONG SCAN SMOOTHED

TS 32015-004
8 March 1980

BURPER MODE
SMA 4

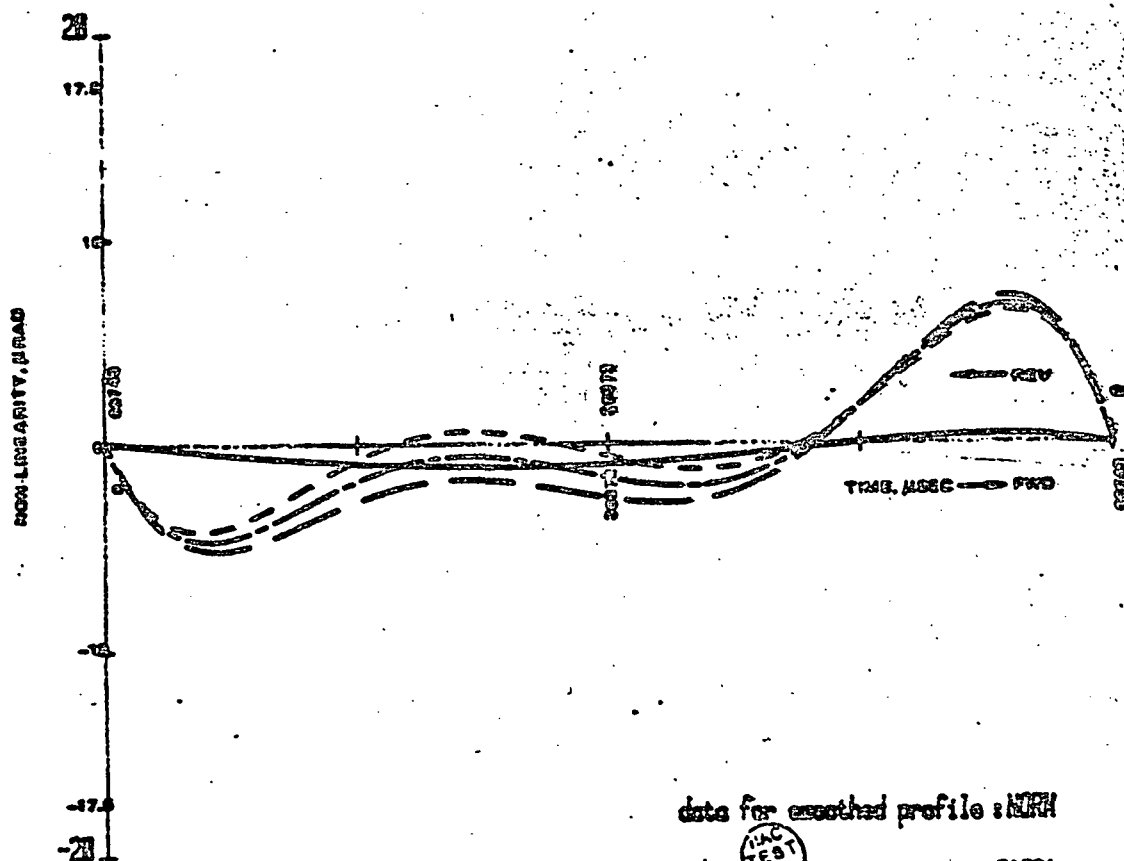
SME (1) or (2) 1
(Nominal Voltages)

28.9-28.8 7.1

SMA Designation F-1 ENG DATA

K = TFEG RUN 31081.0931 16.6
FWD MIDSCAN 16.6
REV MIDSCAN 16.6
NESTED, MIDSCAN: —
NON-NESTED, MIDSCAN: —

— FWD SMOOTHED
— REV SMOOTHED
— NESTED, SMOOTHED
— NON-NESTED SMOOTHED



data for smoothed profile: NFM

Run No. 31081.0931

Test Flow Event H-3

Comments test no. 3

QA Stamp

Tested By

Date 31081

ORIGINAL PAGE IS
OF POOR QUALITY

TS 32015-004
8 March 1980

DATA SHEET 4.3.4-3
SCAN PROFILES
BAND TO BAND REGISTRATION

SMA Designation F-1 ENG DATA

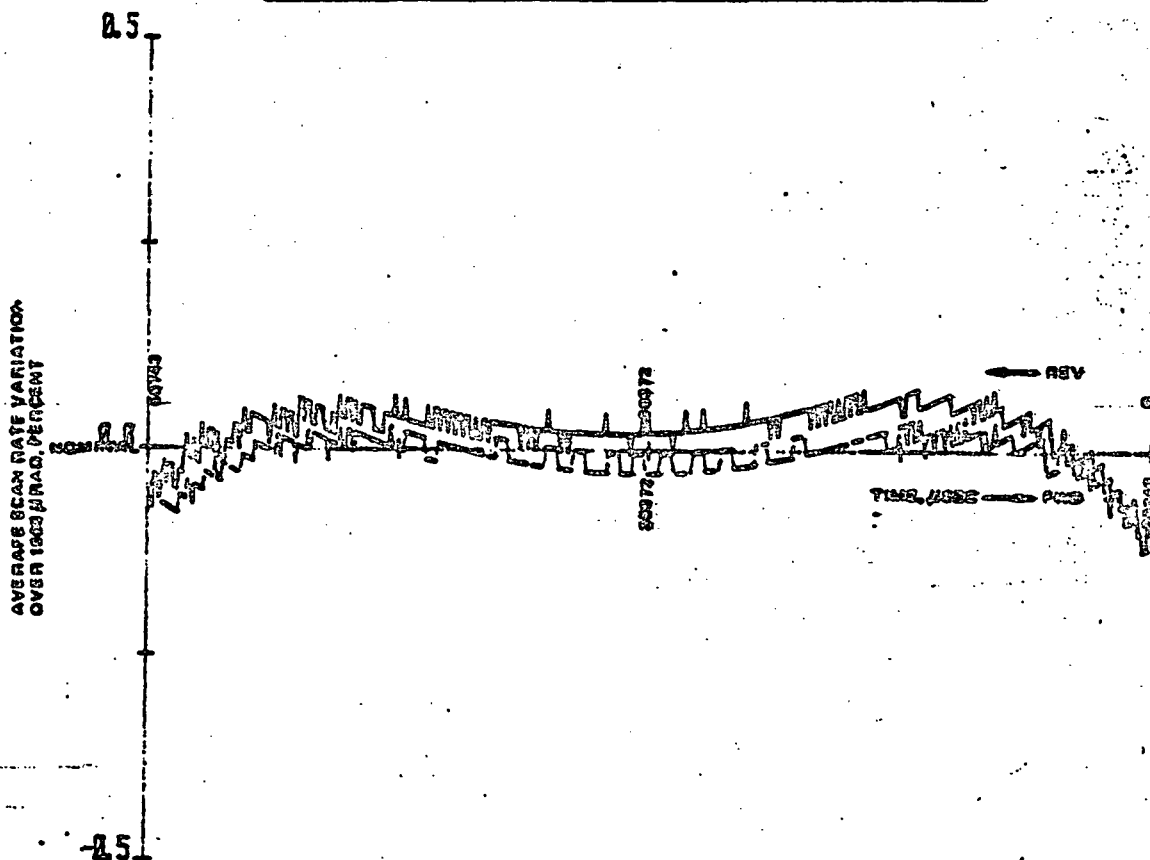
BURPER MODE
SN 4

SME (1) or (2) 1
(Nominal Voltages)

BAND SEPARATION = 75.8 IFV (1678.2 RAD) 28.9-28.8 7.1

| | FWD | REV | QPEC | D/P |
|--|-------|-------|--------------|--------------|
| PEAK AVG SCAN RATE | 0.103 | 0.122 | X | X |
| AVG SCAN RATE
(80% OF SCAN)
LESS THAN: | 0.081 | 0.042 | + .094% | P |

FWD _____
REV _____



data used for computations = RAW

Run No. 31081.0931

Test Flow Event H-3

Comments test no. 3

seq 7.2008

QA Stamp _____

Tested By _____

Date 3/10/81

ORIGINAL PAGE IS
OF POOR QUALITY

DATA SHEET 4.3.4.4
SCAN PROFILES
CROSS SCAN
BUNPER MODE

TS 32015-004
R March 1980

SMA Designation F-1 ENG DATA

S/N 4

SME (1) or (2) 1 28.9 -28.8 7.1
(Nominal Voltage)

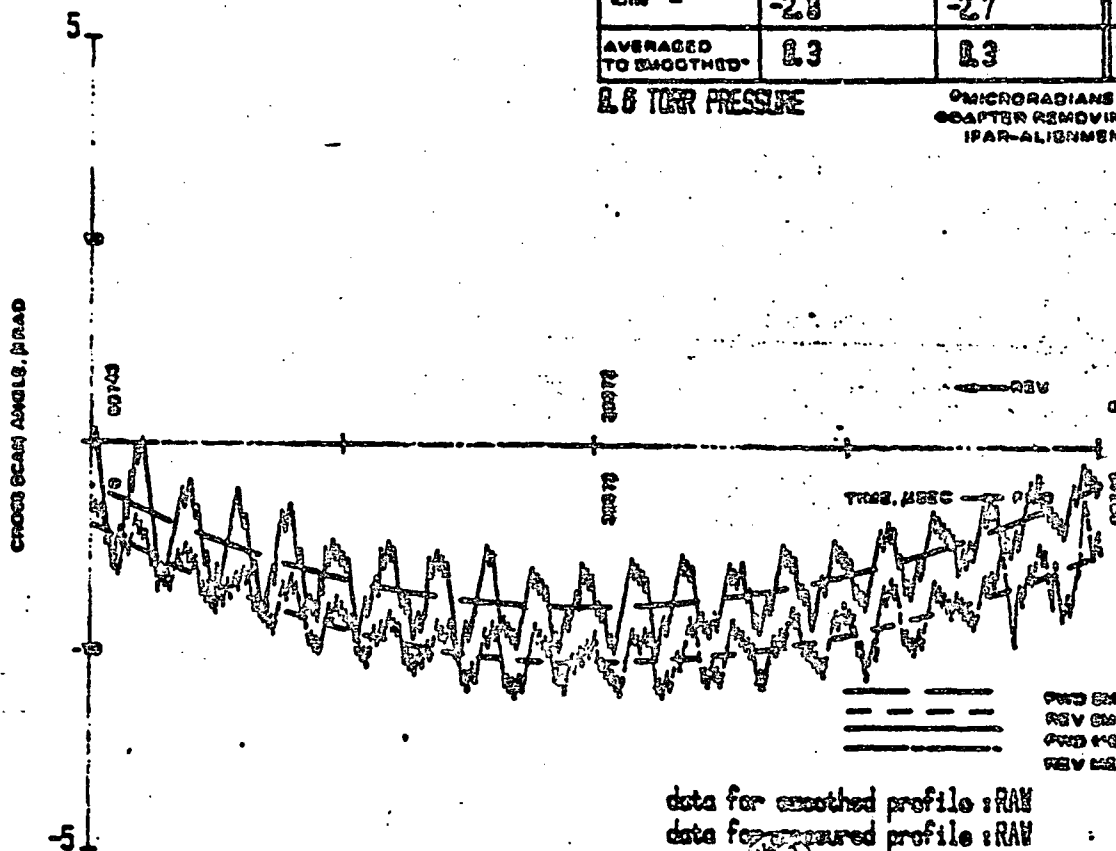
FORWARD LINEAR TERM
REMOVED TO CORRECT FOR
IPAR ALIGNMENT (REV TERM)
- FWD TERM: 97.81 UNCD

SMOOTHING POLYNOMIAL COEFFICIENTS

| ORDER (T) | FWD | REV | 2PSC | P.T. |
|--------------------------|------------|------------|-------------|------|
| 0 | -1.3328-07 | -1.3354-08 | | |
| 1 | -1.8153-04 | -2.2328-05 | | |
| 2 | 1.0723-03 | 2.1573-03 | | |
| 3 | 8.1853-03 | -3.4822-02 | | |
| 4 | -2.0233-01 | 7.5531-01 | | |
| 5 | 1.0023-05 | -4.0023-04 | | |
| INFLECTION
POINTS | 8 | 8 | 43 | - |
| MAX* | -2.5 | -1.8 | 58 | - |
| MIN - | -2.8 | -2.7 | | - |
| AVERAGED
TO SMOOTHED* | 0.3 | 0.3 | 42.0
RMS | - |

0.6 Torr Pressure

0.000000 RADIANS
CARTER REMOVING LINEAR
IPAR ALIGNMENT TERM



data for smoothed profile : RAW
data for measured profile : RAW

Run No. 31081.0331

Test Flow Event H-3

Comments test no. 3

QA Stamp

Tested By

Date 31081

TS 32015-004
8 March 1980

DATA SHEET 4.3.4-5
SCAN PROFILES
CROSS SCAN
SUPER MODE

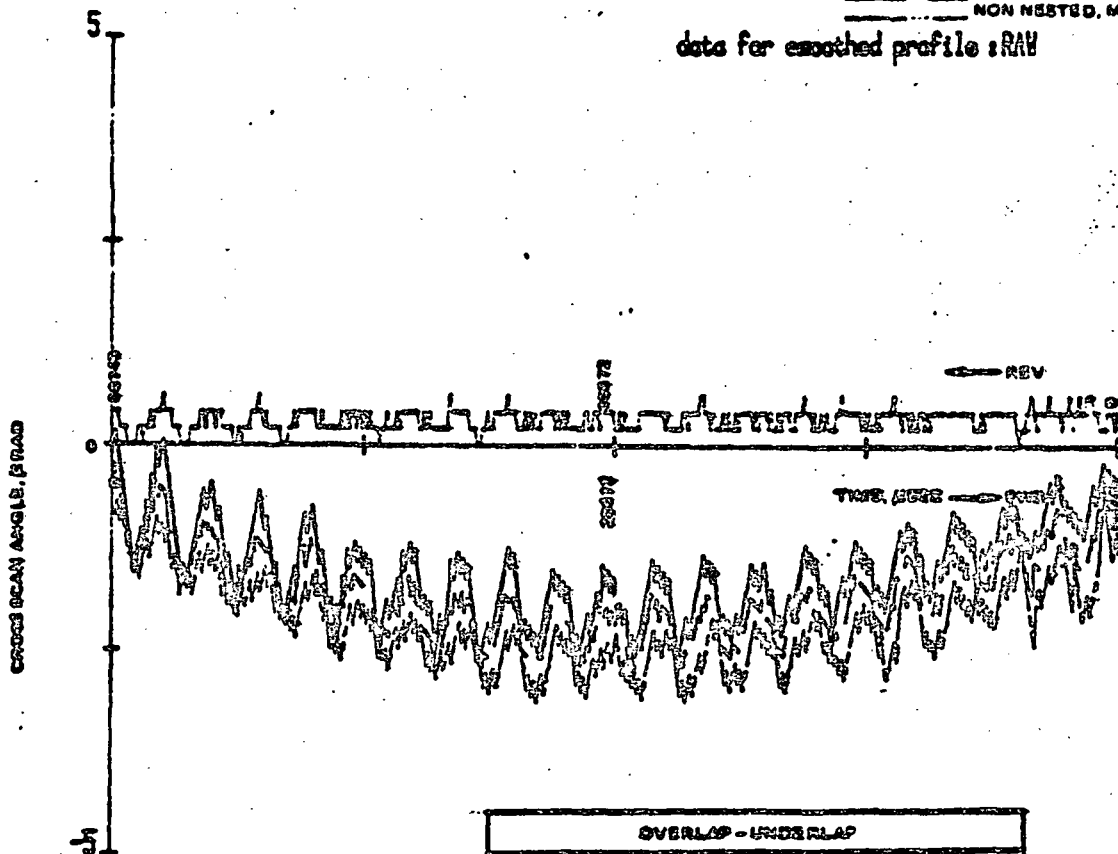
SMA Designation F-1 ENG DATA

SME (1) or (2) 1
(Nominal Volts/cm)
28.0-28.8 7.1

ORIGINAL PAGE IS
OF POOR QUALITY

— PWD MEASURED
— REV MEASURED
— NESTED, MEASURED
— NON NESTED, MEASURED

data for smoothed profile : RAW



| OVERLAP - UNDERLAP | | |
|---|-------------|-----|
| PWD TO REV CROSS SCAN
PROFILE (2X NON-NESTED) (DEGR) | SPEC | PTD |
| max = 1.23 | 0.1
DEGR | - |

Run No. 31031.0331

Test Flow Event H-3 seq 7
test no. 3

Comments

QA Stamp

Date 31031

Tested By

NO. REQ'D = 2
VOLUME

ORIGINAL PAGE IS
OF POOR QUALITY


REPORT-PL-100-114-14-031781

===== INITIAL CONDITIONS =====
1) Fans must be off for at least 20 min.
2) Both Lasers must be on at least 45 min
3) STS temp (+Z+X) must be +/-1 deg from (-Z-X)
4) Chamber pressure must be less than 2 torr
5) Cross axis polarity correct
=====

Temperatures and Voltages

| Ch | Scanner Out | Device | Cal | Measurement |
|----|-------------|----------|-----|--------------|
| 4 | 2.0355E 03 | SMA -Z | 1 | 24.604 Deg C |
| 2 | 9.0731E 03 | MF(-Z-X) | 3 | 24.406 Deg C |
| 13 | 9.0749E 03 | MF(+Z+X) | 3 | 24.392 Deg C |

Date: 031081 Time: 0931

SM Designation: F-1 ~~ACCEPT TEST~~ **End Data** 
Serial Number: 4
Run Number: 31081.0931
Test Flow Event: H
Test Number: 3
Sequence Number: 7

B(1)
Sog7

INITIALIZE Words Transferred: 4

Word Number 0: INTERRUPT (Raw 177771 Octal)

| Bit | Description | Setting |
|-----|----------------|---------|
| 0 | Panel Mode | 1 |
| 1 | Calibrate Mode | 0 |
| 2 | Scan Mode | 0 |

Word Number 1: PANEL STATUS (Raw 042402 Octal)

| Bit | Description | Setting |
|-----|---------------------|---------|
| 0 | Bumper SW On | 0 |
| 1 | Beq SAM P0/P3 | 1 |
| 2 | Beq SAM P2/P3 | 0 |
| 3 | Beq SAM PA/PB | 0 |
| 45 | Processed SAM | 1 |
| 45 | Raw SAM | 0 |
| 45 | SAM 1 or SAM 2 | 0 |
| 45 | SAM 3 (CAL SAM) | 0 |
| 6 | Single Reset | 0 |
| 7 | End SAM P0/P3 | 0 |
| 8 | End SAM P2/P5 | 1 |
| 9 | End SAM PD/PE | 0 |
| 10 | Ext Reset | 1 |
| 11 | 5 Facet | 0 |
| 12 | Calibrate Mode | 0 |
| 13 | Scan Mode | 0 |
| 14 | Initialize Mode | 1 |
| 15 | Slow Telemetry Mode | 0 |

Word Numbers 2 and 3: (Raw 177633 057774 Octal)

| | | | |
|--------------------|------------|-----------------|-----|
| Scan Count Preset: | 7774 Octal | No. of Scans: | 3 |
| Time Count Preset: | 3774665 | No. of Samples: | 400 |

Number of Scans of S\$ Dimension: 3
Scans x Samples: 1200
Number of Samples plus 1: 401
Dimension of S\$ Array: 5018
Dimension of S\$ Array: 6

-----P0P5-----

| | | | |
|------------|-------|-----------|--------|
| Along | Cross | A-Octal-B | |
| ave 0.10 | -0.34 | Minutes: | 572.42 |
| sigma 0.30 | 0.73 | | |

ORIGINAL PAGE IS
OF POOR QUALITY

-----BUMPER B-----

| | | | |
|--------------|-------|-----------|--------|
| Along | Cross | A-Octal-B | |
| ave -3208.00 | -3.45 | Minutes: | 572.80 |
| sigma 0.00 | 0.51 | | |

-----P1P2-----

| | | | |
|---------------|--------|-----------|--------|
| Along | Cross | A-Octal-B | |
| ave 164220.82 | 113.90 | Minutes: | 573.05 |
| sigma 0.38 | 0.72 | | |

-----BUMPER A-----

| | | | |
|---------------|--------|-----------|--------|
| Along | Cross | A-Octal-B | |
| ave 331913.00 | 240.00 | Minutes: | 573.48 |
| sigma 0.00 | 0.00 | | |

-----P2P3-----

| | | | |
|---------------|--------|-----------|--------|
| Along | Cross | A-Octal-B | |
| ave 328382.00 | 236.14 | Minutes: | 573.72 |
| sigma 0.00 | 0.35 | | |

-----P0P5-----

| | | | |
|------------|-------|-----------|--------|
| Along | Cross | A-Octal-B | |
| ave 0.14 | -0.96 | Minutes: | 574.28 |
| sigma 0.35 | 0.86 | | |

Along Scan Calibration
Time at end of Cal: 934.17

| Facet | IFAR Counts | Preset Angles | No,a,b |
|-------|------------------|----------------|---------------|
| P0P5 | 0.14 -0.96 | -6.7170900E-02 | 1.6422085E 05 |
| P1P4 | 164220.85 113.49 | 0.0000000E 00 | 2.4464278E 06 |
| P2P3 | 328382.01 235.95 | 6.7159200E-02 | 1.3743925E 04 |

K = 0.500091

Bumper A: 331913.02
Bumper B: -3207.97

CROSS SCAN conversion factor: 0.409urad/IFAR count
CROSS AXIS THERM DRIFT RATE: 0.14urad/min
CROSS SCAN linear term removed: 96.92urad

diff in K= 0.500091

-----P0P5-----

| | | | |
|------------|-------|-----------|--------|
| Along | Cross | A-Octal-B | |
| ave 0.29 | 0.02 | Minutes: | 574.83 |
| sigma 0.45 | 0.51 | | |

-----BUMPER B-----

| | | |
|-------|-------|-----------|
| Along | Cross | A-Octal-B |
|-------|-------|-----------|

Time at end of Cal: 575.52
 Minutes: 575.52

ORIGINAL PAGE IS
 OF POOR QUALITY

-----BUMP A-----
 Along Cross A-Octal-B
 331912.48 240.65 Minutes: 575.95
 Sigma 0.58 0.49

-----P2P3-----
 Along Cross A-Octal-B
 328382.00 237.41 Minutes: 576.17
 Sigma 0.00 0.49

-----P0P5-----
 Along Cross A-Octal-B
 -1.13 0.36 Minutes: 576.70
 Sigma 0.34 0.48

Time Scan Calibration
 Time at end of Cal: 936.42

| Angles | IFAR Counts | Preset Angles | No. a, b |
|--------|------------------|----------------|---------------|
| P0P5 | -1.13 0.36 | -6.7170900E-02 | 1.6421967E 05 |
| P1P4 | 164219.67 115.05 | 0.0000000E 00 | 2.4464342E 06 |
| P2P3 | 328381.59 237.51 | 6.7159200E-02 | 1.3451754E 04 |

K = 0.500090

Bumper A: 331912.83
 Bumper B: -3208.36

CROSS SCAN conversion factor: 0.409urad/IFAR count
 CROSS AXIS THERM DRIFT RATE: 0.08urad/min
 CROSS SCAN linear term removed: 97.01urad

Time in K = 0.000001

data collection: 2; tape AT-FM, trk 0, file 5, rev 22681

Time at end of SCAN: 937.24 577.40
 Time between Cal and Scan: 0.82min
 CROSS AXIS DRIFT: (last P0 to SCAN): 0.06urad
 CROSS AXIS REFERENCE OFFSET: 0.21urad

Time at end of SCAN: 937.35 577.58
 Time between Cal and Scan: 0.93min
 CROSS AXIS DRIFT: (last P0 to SCAN): 0.07urad
 CROSS AXIS REFERENCE OFFSET: 0.22urad

Time at end of SCAN: 937.47 577.78
 Time between Cal and Scan: 1.05min
 CROSS AXIS DRIFT: (last P0 to SCAN): 0.08urad
 CROSS AXIS REFERENCE OFFSET: 0.23urad

Time at end of SCAN: 937.55 577.92
 Time between Cal and Scan: 1.13min
 CROSS AXIS DRIFT: (last P0 to SCAN): 0.09urad

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OF POOR QUALITY

Time at end of SCAN: 139.02 578.03
Time between Cal and Scan: 1.60min
CROSS AXIS DRIFT: (last P0 to SCAN): 0.12urad
CROSS AXIS REFERENCE OFFSET: 0.27urad

Chamber Pressure (torr): 0.60

Temperatures and Voltages

| Ch | Scanner Out | Device | Cal | Measurement |
|----|-------------|------------|-----|----------------|
| 0 | -1.0000E 04 | QUARTER | 3 | ERROR |
| 1 | 2.2514E-02 | EU=6.8I | 5 | 2261.400 mAmps |
| 2 | 1.5550E-03 | EU=+27I | 5 | 31.100 mAmps |
| 3 | -1.2980E-03 | EU=-27I | 5 | 25.960 mAmps |
| 4 | 2.0259E 03 | SMA -Z | 1 | 24.715 Deg C |
| 5 | 1.9731E 03 | SMA -X | 1 | 25.400 Deg C |
| 6 | 1.9402E 03 | SMA +Z | 1 | 25.871 Deg C |
| 7 | 2.0042E 03 | SMA +X | 1 | 24.963 Deg C |
| 8 | 2.0018E 03 | TORQ, BRDG | 1 | 24.991 Deg C |
| 9 | 8.4198E 02 | SME TEMP | 2 | 29.554 Deg C |
| 10 | 1.8925E 03 | SAM TEMP | 1 | 26.554 Deg C |
| 11 | 7.0901E 00 | EU=6.8V | 4 | 7.090 Volts |
| 12 | 9.0650E 03 | MF(-Z-X) | 3 | 24.470 Deg C |
| 13 | 9.0659E 03 | MF(+Z+X) | 3 | 24.463 Deg C |
| 14 | 4.3363E 00 | SME(1)TEL | 4 | 4.336 Volts |
| 15 | 4.1763E-01 | SME(2)TEL | 4 | 0.418 Volts |
| 16 | -1.0000E 04 | SME PR U7 | 3 | ERROR |
| 17 | 1.7850E-01 | SAM1/BMP2 | 4 | 0.179 Volts |
| 18 | 2.8887E 01 | EU=+27V | 4 | 28.887 Volts |
| 19 | -2.8824E 01 | EU=-27V | 4 | -28.824 Volts |

Data Tape Identifier: F1D8
 Check for Data: 1
 Init/Cal Data File Number: 11
 Scan Data File Number: 12
 Norm/Avg Scan Data File Number: 13
 Smoothing Coeffs File Number: 14

=====

IF 'PERF' 48 OCCURS DURING MARKING OF TAPE

press <F1> to RECAL--press <F2> to RECAL--press continue

=====

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TELETYPE PRINTOUT, 2; tape AT-F, trk 0, file 15, rev 22381

031001 Time: 0931

CONA Designation: F-1 ENG DATA
Data Number: 4
Run Number: 31081.0931
Test Flow Event: H
Test Number: 3
Sequence Number: 7

Data tape identifier: FID8
Track for data: 1
IN/OUT data file number: 11
SCAN data file number: 12
NORM AVG SCAN data file number: 13
On Machine Coeffs file number: 14

Mode selected: NORM

TELEMETRY PRINTOUT, 2; tape AT-F, trk 0, file 16, rev 22381

Date: 031001 (TEST) Data Time: 0931

BUMPER MODE operation

Scan N: 1 no. of words transferred = 837

Line Length, N-1: 005 306 320 000
Bumper to Bumper Time, N-1: 71342.8
Final Time, N: 60743.20

B (1)

TELEMETRY

| Line No | Name | Contents | Pulses | Time(μsec) |
|---------|------------------|-------------|--------|------------|
| 1 | SYNC | 200 | | |
| 2 | OPSTAT N | 046 | | |
| 3 | SCN LIN N | 130 | 88 | 16.58 |
| 4 | 5 TRNERR N | 000 000 | 0 | 0.00 |
| 6 | 7 TORPLS N | 356 044 | -4572 | -861.59 |
| 8 | 9 SHSERR N-1 | 000 000 | 0 | 0.00 |
| 10 | 11 FHSERR N-1 | 000 000 | 0 | 0.00 |
| 12 | 13 14 SUMERR N-1 | 377 356 044 | -4572 | -861.59 |
| 15 | 16 SCHCTR | 001 201 | | |
| 17 | SCN LIN N-1 | 250 | -88 | -16.58 |
| 18 | 19 TRNERR N-1 | 000 000 | 0 | 0.00 |
| 20 | 21 TORPLS N-1 | 356 267 | -4425 | -833.89 |
| 22 | 23 SHSERR N-2 | 000 000 | 0 | 0.00 |
| 24 | 25 FHSERR N-2 | 000 000 | 0 | 0.00 |
| 26 | 27 SUMERR N-2 | 377 356 044 | -4425 | -833.89 |
| 28 | 29 SCHCTR | 001 201 | | |
| 30 | 31 SCN LIN N-1 | 250 | -88 | -16.58 |
| 32 | 33 TRNERR N-1 | 000 000 | 0 | 0.00 |
| 34 | 35 TORPLS N-1 | 356 267 | -4425 | -833.89 |
| 36 | 37 SHSERR N-1 | 000 000 | 0 | 0.00 |
| 38 | 39 FHSERR N-1 | 000 000 | 0 | 0.00 |
| 40 | 41 SUMERR N-1 | 377 356 044 | -4425 | -833.89 |
| 42 | 42 SCHCTR | 001 201 | | |
| 43 | 43 SCN LIN N-1 | 250 | -88 | -16.58 |
| 44 | 45 TRNERR N-1 | 000 000 | 0 | 0.00 |
| 46 | 47 TORPLS N-1 | 356 267 | -4425 | -833.89 |
| 48 | 49 SHSERR N-1 | 000 000 | 0 | 0.00 |
| 50 | 51 FHSERR N-1 | 000 000 | 0 | 0.00 |
| 52 | 53 SUMERR N-1 | 377 356 044 | -4425 | -833.89 |
| 54 | 54 SCHCTR | 001 201 | | |
| 55 | 55 SCN LIN N-1 | 250 | -88 | -16.58 |
| 56 | 57 TRNERR N-1 | 000 000 | 0 | 0.00 |
| 58 | 59 TORPLS N-1 | 356 267 | -4425 | -833.89 |
| 60 | 61 SHSERR N-1 | 000 000 | 0 | 0.00 |
| 62 | 63 FHSERR N-1 | 000 000 | 0 | 0.00 |
| 64 | 65 SUMERR N-1 | 377 356 044 | -4425 | -833.89 |
| 66 | 66 SCHCTR | 001 201 | | |
| 67 | 67 SCN LIN N-1 | 250 | -88 | -16.58 |
| 68 | 69 TRNERR N-1 | 000 000 | 0 | 0.00 |
| 70 | 71 TORPLS N-1 | 356 267 | -4425 | -833.89 |
| 72 | 73 SHSERR N-1 | 000 000 | 0 | 0.00 |
| 74 | 75 FHSERR N-1 | 000 000 | 0 | 0.00 |
| 76 | 77 SUMERR N-1 | 377 356 044 | -4425 | -833.89 |
| 78 | 78 SCHCTR | 001 201 | | |
| 79 | 79 SCN LIN N-1 | 250 | -88 | -16.58 |
| 80 | 81 TRNERR N-1 | 000 000 | 0 | 0.00 |
| 82 | 83 TORPLS N-1 | 356 267 | -4425 | -833.89 |
| 84 | 85 SHSERR N-1 | 000 000 | 0 | 0.00 |
| 86 | 87 FHSERR N-1 | 000 000 | 0 | 0.00 |
| 88 | 89 SUMERR N-1 | 377 356 044 | -4425 | -833.89 |
| 90 | 90 SCHCTR | 001 201 | | |
| 91 | 91 SCN LIN N-1 | 250 | -88 | -16.58 |
| 92 | 93 TRNERR N-1 | 000 000 | 0 | 0.00 |
| 94 | 95 TORPLS N-1 | 356 267 | -4425 | -833.89 |
| 96 | 97 SHSERR N-1 | 000 000 | 0 | 0.00 |
| 98 | 99 FHSERR N-1 | 000 000 | 0 | 0.00 |
| 100 | 100 SUMERR N-1 | 377 356 044 | -4425 | -833.89 |

scan #: 2 no. of words transferred = 832

Line Length, N-1: 005 306 321 377

Bumper to Bumper Time, N-1: 71343.0

Final Time, N-1: 60743.11

TELEMETRY

| Byte No | Name | Contents | Pulses | Time(usec) |
|---------|------------------|-------------|----------------------------|--------------|
| 1 | SYNO | 200 | | |
| 2 | OPSTAT N | 246 | Bit 7 = 1: Scan N= Reverse | |
| 3 | SCHLIN N | 250 | -88 | -16.58 |
| 4 | 5 TRNERR N | 000 000 | 0 | 0.00 |
| 6 | 7 TORPLS N | 356 267 | -4425 | -833.89 |
| 8 | 9 SHSERR N-1 | 000 000 | 0 | 0.00 |
| 10 | 11 FHSERR N-1 | 000 000 | 0 | 0.00 |
| 12 | 13 14 SUMERR N-1 | 377 356 267 | -4425 | -833.89 |
| 15 | 16 SCHCTR | 001 202 | | |
| 17 | SCHLIN N-1 | 130 | 88 | 16.58 |
| 18 | 19 TRNERR N-1 | 000 000 | 0 | 0.00 |
| 20 | 21 TORPLS N-1 | 356 044 | -4572 | -861.59 |
| 22 | 23 SHSERR N-2 | 000 000 | 0 | 0.00 |
| 24 | 25 FHSERR N-2 | 000 000 | 0 | 0.00 |
| 26 | 27 28 SUMERR N-2 | 377 356 044 | -4572 | -861.59 |
| 29 | 30 31 SCHTYM N-2 | 004 353 030 | 322328 | 60742.82 |
| 32 | NSCANS | 037 | No.Scans = | 31 (decimal) |

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DATA SHEET 4.3.4-1
SCAN PROFILES
ALONG SCAN

TS 32015-004
8 March 1980

SMA Designation **F-1 ENG DATA** **SAN MODE** **S/N 4** **SME (1) or (2)** **2** **28.9-23.8 7.1** (Nominal Voltages)

T1 T2 T3 T4 T5 T6 T7 T8 T9
28.2 24.9 25.3 25.8 25.4 23.8 23.9 24.6 24.6

SAN ANGLES USED (MRAD) -57.182 57.183

WAS COUNTS R - CALIBRATION **1.500000**

PAST SCAN

BUMPER A 3514
P2 P3 328423 328433 328418
MID #1 P4 184237 184248 184235
P0 P5 -1 3 8
BUMPER B -3188 3

CORRECTED SCAN ANGLES (RESP P0, MRAD):
P2 134343 P3 134338
P1 57185 P4 57188
P0 8 P5 -1
NEXT P0 5

| ORDER (1) | PWD | REV | SPEC | P/P |
|----------------------|-------------|-------------|------|-----|
| 0 | 4.3144e-07 | -2.1578e-07 | | |
| 1 | -1.6533e-03 | 3.1184e-03 | | |
| 2 | 2.4434e-01 | -2.2331e-01 | | |
| 3 | -1.1422e-01 | 1.3313e-01 | | |
| 4 | 2.1937e-02 | -2.3553e-02 | | |
| 5 | -1.4945e-03 | 1.4991e-03 | | |
| INFLECTION POINTS | 3 | 3 | | P |
| MAK - | 0.3 | 0.9 | | P |
| MAN - | -3.8 | -1.9 | | P |
| AVERAGED TO SMOOTHED | 0.2 | 0.2 | | P |

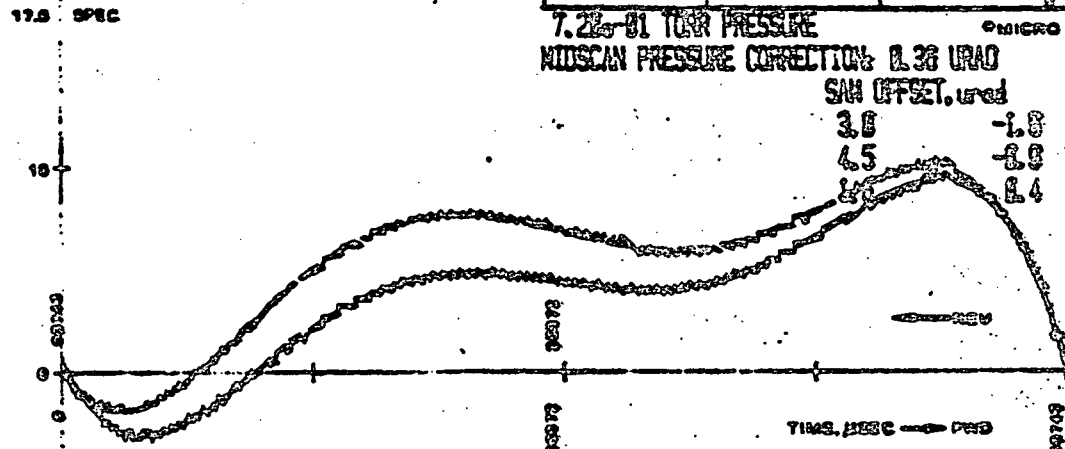
7.25-01 TURBINE PRESSURE MICRO RADIANS

MIDSCAN PRESSURE CORRECTION: 0.38 URAD

SAN OFFSET, URAD

3.8 -1.8
4.5 -2.0
4.5 -2.4

NON-LINEARITY, MRAD



--- REV SMOOTHED
--- REV MEASURED
--- PWD SMOOTHED
--- PWD MEASURED

data for smoothed profile: NORM

data for measured profile: NORM

Run No. 31281.0350

Test Flow Event H-14 seq 7

Comments test no. 14

QA Stamp  Date 31031

Tested By 

NO. REQ'D -
VOLUME

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DATA SHEET 4.34-2
SCAN PROFILES
ALONG SCAN SMOOTHED

TS 32015-004
8 March 1980

354

SMA Designation F-1 ENG DATA

SAH MODE 3/M 4

SME (1) or (2) 2
(Nominal Voltages)

R- 0.50000
FWD MIDSCAN
REV MIDSCAN
NESTED, MIDSCAN
NON-NESTED, MIDSCAN

4.32
6.75
1.34
-1.21

from SMOOTHED PROFILES

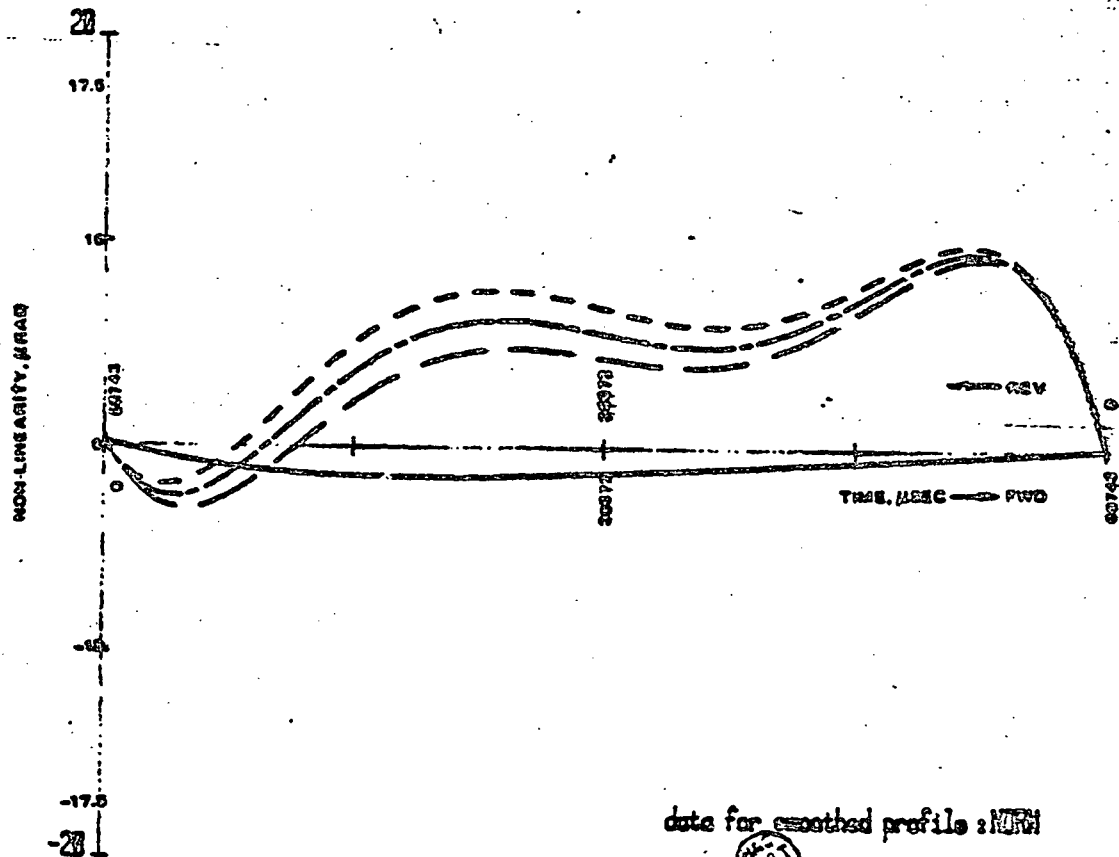
28.9 -28.8 7.1

PERIOD
1st HALF
2nd HALF
PHI_L
PHI_{L0}, PHI_{R0}

FWD
00742.81
30374.23
30368.58
4.91
4.55

REV
00742.43
30364.76
30373.67
5.72
6.08

— FWD SMOOTHED
— REV SMOOTHED
— NESTED, SMOOTHED
— NON-NESTED SMOOTHED



Run No. 31001.0050

OIA Stamp

Date 31001

Test Flow Event H-14 seq 7

Tested By

Comments test no. 141 FWD/1 REV SCAN, 400pts each

NO. REQ'D
VOLUME

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OF POOR QUALITY

DATA SHEET 4.3-4.3
SCAN PROFILES
BAND TO BAND REGISTRATION

TS 32015-004
8 March 1980

SMA Designation F-1 ENG DATA

SAN MODE

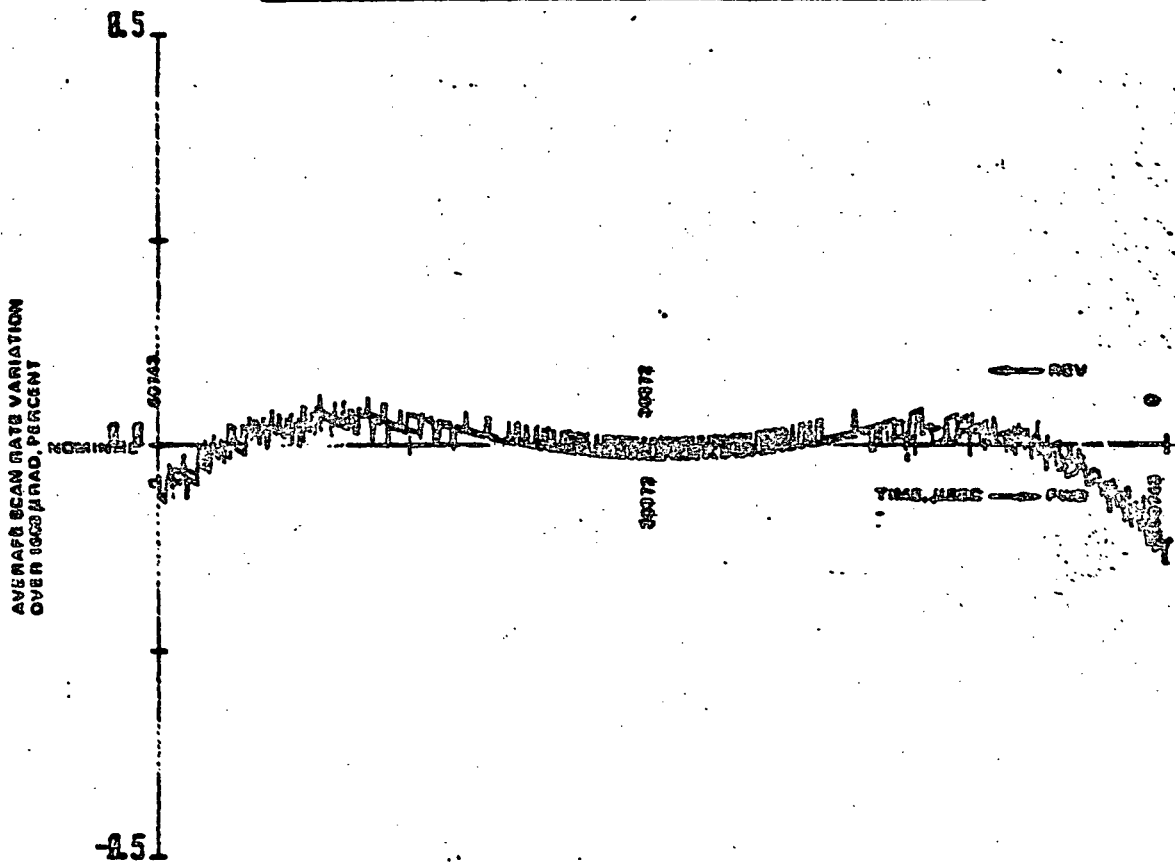
S/N 4

SME (1) or (2) 2
(Nominal Voltages)

BAND SEPARATION = 75.8 IFV (1678.2 μ RAD 28.9-28.8 7.1

| | FWD | REV | SPSC | P/P |
|--|-------|-------|-----------------|-----------------|
| PEAK AVG SCAN RATE | 0.123 | 0.145 | XXXX | XXXX |
| AVG SCAN RATE
(90% OF SCAN)
LESS THAN: | 0.048 | 0.042 | + .034% | P |

FWD
REV



data used for computations = RAW

Run No. 31081.0950

Test Flow Event H-14 seq 7.0000

Comments test no. 14

QA Stamp

Date

Tested By

NO. REC'D - 2
VOLUME

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DATA SHEET 4.3.4.4
SCAN PROFILES
CROSS SCAN

TS 32015-004
8 March 1980

356

SMA Designation F-1 ENG DATA

FORWARD LINEAR TERM
REMOVED TO CORRECT FOR
IPAR ALIGNMENT (REV TERM
- FWD TERM): 98.74 μ rad

SAW MODE

S/N 4

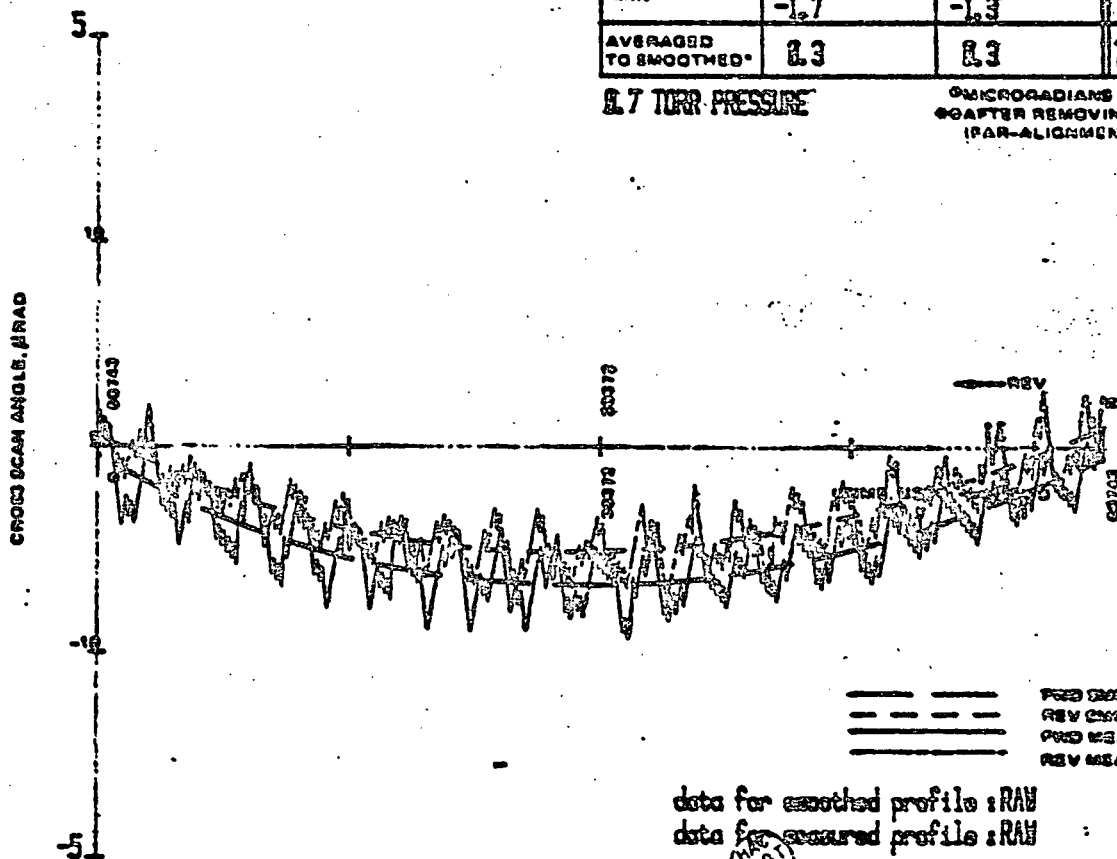
SME (1) or (2) 2 28.9-28.8 7.1
(Nominal Voltage)

SMOOTHING POLYNOMIAL COEFFICIENTS

| ORDER (I) | FWD | REV | SPEC | P/R |
|--------------------------|--------------|-------------|-------------|-----|
| 0 | -1.1935-87 | 2.327-87 | | |
| 1 | -1.2148-84 | -1.285-85 | | |
| 2 | 2.9221-83 | 1.5748-83 | | |
| 3 | -2.9348-82 | -1.3242-82 | | |
| 4 | 3.3941-81 | 2.9515-81 | | |
| 5 | -1.7827-80 | -1.9746-80 | | |
| INFLECTION
POINTS | 0 | 0 | G | P |
| MAX*
MIN - | -8.1
-1.7 | 8.2
-1.3 | 11
23 | P |
| AVERAGED
TO SMOOTHED* | 8.3 | 8.3 | 11.8
RMS | P |

8.7 Torr Pressure

0 MICRORADIANS
AFTER REMOVING LINEAR
IPAR ALIGNMENT TERM



data for smoothed profile:RAW
data for measured profile:RAW

Run No. 31681.8958

Test Flow Event H-14 seq. 7

Comments test no. 14

QA Stamp Date 31681

Tested By

NO. REQ'D - 2
VELLUM

ORIGINAL PAGE IS
OF POOR QUALITY

TS 32015-004
8 March 1980

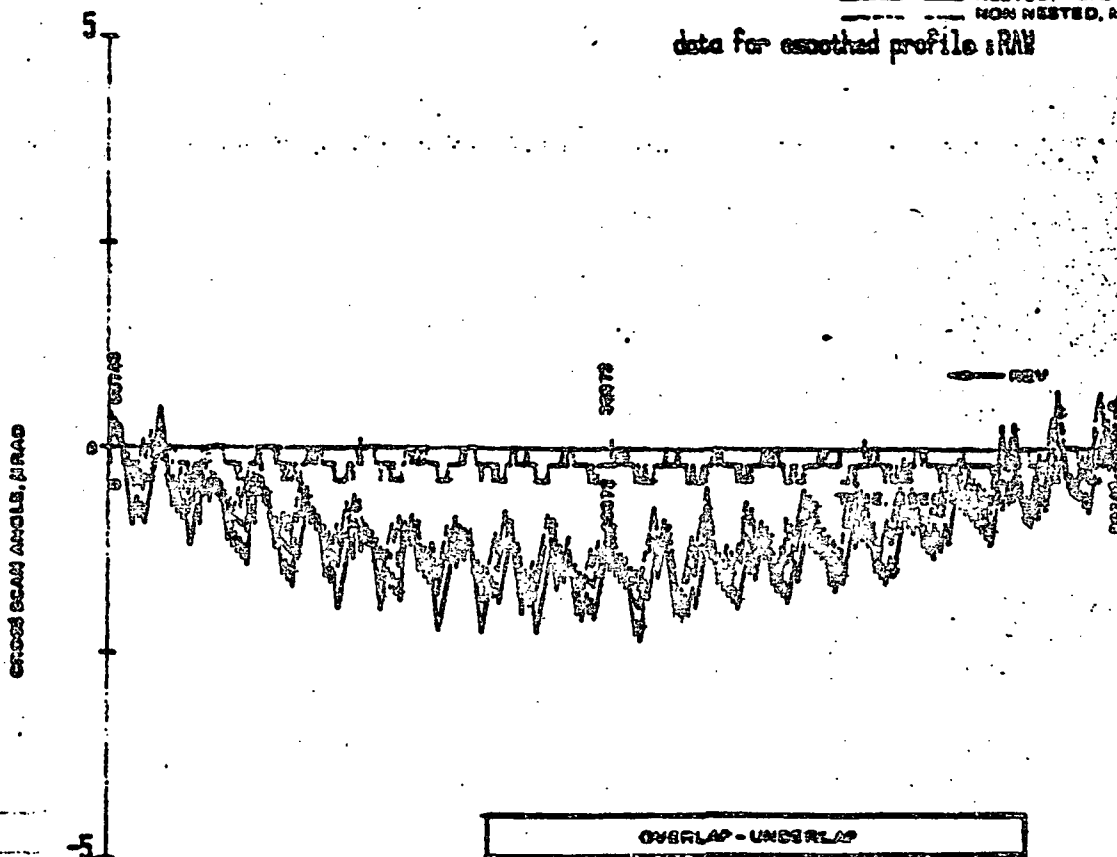
DATA SHEET 4.3.4-6
SCAN PROFILES
CROSS SCAN
SAW MODE
SN 4

SMA Designation F-1 ENG DATA

SME (1) or (2) 2
(Nominal Voltage)
21.9-21.8 7.1

FOO MEASURED
REV MEASURED
NESTED, MEASURED
NON NESTED, MEASURED

data for smoothed profile: RAW



| OVERLAP - UNDERLAP | | |
|---|-------------|-----|
| FOO TO REV CROSS SCAN
PROFILE (2X NON-NESTED) /RAD | SPC | P/P |
| MAX = 1.02 | 0.1
/RAD | P |

Run No. 31091.1958

Test Flow Event H-14 seq 7
test no. 14

Comments

QA Stamp

Tested By

Date

31091

NO. REC'D - 2
VLL/MS

ORIGINAL PAGE IS
OF POOR QUALITY

data collection: 1: tape AT-FM, ctrl 0, file 4, rev 022781

=====TEST INITIAL CONDITIONS=====

- 1) Fans must be off for at least 20 min.
 - 2) Both Lasers must be on at least 45 min
 - 3) DTS temp (+Z+X) must be +/-1 deg from (-Z-X)
 - 4) Chamber pressure must be less than 2 torr
 - 5) Cross axis polarity correct
- =====

Temperatures and Voltages

| Ch | Scanner Out | Device | Cal | Measurement |
|----|-------------|----------|-----|--------------|
| 4 | 2.0207E 03 | SMA -Z | 1 | 24.775 Deg C |
| 12 | 9.0574E 03 | MF(-Z-X) | 3 | 24.530 Deg C |
| 13 | 9.0512E 03 | MF(+Z+X) | 3 | 24.578 Deg C |

Date: 031081 Time: 0950

SMA Designation: F-1 ENG DATA
Serial Number: 4
Run Number: 31081.0950
Test Flow Event: H
Test Number: 14
Sequence Number: 7

INITIALIZE Words Transferred: 4

Word Number 0: INTERRUPT (Raw 177771 Octal)

| Bit | Description | Setting |
|-----|----------------|---------|
| 0 | Panel Mode | 1 |
| 1 | Calibrate Mode | 0 |
| 2 | Scan Mode | 0 |

Word Number 1: PANEL STATUS (Raw 042402 Octal)

| Bit | Description | Setting |
|-----|---------------------|---------|
| 0 | Bumper SW On | 0 |
| 1 | Beg SAM P0/P3 | 1 |
| 2 | Beg SAM P2/P5 | 0 |
| 3 | Beg SAM PA/PB | 0 |
| 45 | Processed SAM | 1 |
| 45 | Raw SAM | 0 |
| 45 | SAM 1 or SAM 2 | 0 |
| 45 | SAM 3 (CAL SAM) | 0 |
| 6 | Single Reset | 0 |
| 7 | End SAM P0/P3 | 0 |
| 8 | End SAM P2/P5 | 1 |
| 9 | End SAM PD/PE | 0 |
| 10 | Ext Reset | 1 |
| 11 | 5 Facet | 0 |
| 12 | Calibrate Mode | 0 |
| 13 | Scan Mode | 0 |
| 14 | Initialize Mode | 1 |
| 15 | Slow Telemetry Mode | 0 |

Word Numbers 2 and 3: (Raw 177633 057774 Octal)

| | | | |
|--------------------|------------|-----------------|-----|
| Scan Count Preset: | 7774 Octal | No. of Scans: | 3 |
| Time Count Preset: | 3774665 | No. of Samples: | 400 |

Number of Scans of S₃ Dimension: 3
Scans x Samples: 1200
Number of Samples plus 1: 401
Dimension of S₃ Array: 5018
Dimension of M₃ Array: 6

-----POP5-----
 Along Cross A-Octal-B
 Avg -1.23 0.28 Minutes: 590.72
 Sigma 0.40 0.94

ORIGINAL PAGE IS
 OF POOR QUALITY

-----BUMPER B-----
 Along Cross A-Octal-B
 Avg -3188.00 -2.00 Minutes: 591.18
 Sigma 0.00 0.00

-----PIP2-----
 Along Cross A-Octal-B
 Avg 164236.69 116.33 Minutes: 591.57
 Sigma 0.46 0.52

-----BUMPER A-----
 Along Cross A-Octal-B
 Avg 331935.00 240.00 Minutes: 592.00
 Sigma 0.00 0.00

-----P2P3-----
 Along Cross A-Octal-B
 Avg 328421.00 237.22 Minutes: 592.28
 Sigma 0.00 0.41

-----POP5-----
 Along Cross A-Octal-B
 Avg -1.58 0.00 Minutes: 592.87
 Sigma 0.49 0.00

Long Scan Calibration
 Time at end of Cal: 952.52

| Facet | IFAR Counts | Preset Angles | Normal b |
|-------|------------------|----------------|----------------|
| POP5 | -1.58 0.00 | -6.7182000E-02 | 1.6423646E 05 |
| PIP4 | 164236.46 116.16 | 0.0000000E 00 | 2.4465194E 06 |
| P2P3 | 328420.90 237.14 | 6.7159700E-02 | -3.7005695E 02 |

K = 0.500082

Bumper A: 331934.85
 Bumper B: -3188.29

CROSS SCAN conversion factor: 0.409urad/IFAR count

CROSS AXIS THERM DRIFT RATE: 0.05urad/min

CROSS SCAN linear term removed: 97.00urad

diff in K= 0.500082

-----POP5-----
 Along Cross A-Octal-B
 Avg 0.59 0.82 Minutes: 593.62
 Sigma 0.49 0.38

-----BUMPER B-----
 Along Cross A-Octal-B
 Avg -1.40 Minutes: 594.05

ORIGINAL PAGE IS
OF POOR QUALITY

-----P1P2-----
Along Cross A-Octal-B
Avg 164239.82 115.94 Minutes: 594.32
Sigma 0.39 0.39

-----BUMPER A-----
Along Cross A-Octal-B
Avg 331939.00 240.00 Minutes: 594.77
Sigma 0.00 0.00

-----P2P3-----
Along Cross A-Octal-B
Avg 328424.33 237.54 Minutes: 595.00
Sigma 0.47 0.66

-----P0P5-----
Along Cross A-Octal-B
Avg 1.94 0.52 Minutes: 595.58
Sigma 0.69 0.50

Along Scan Calibration
Time at end of Cal: 955.35

| Facet | IFAR Counts | Preset Angles | No. a, b |
|-------|------------------|----------------|---------------|
| P0P5 | 1.94 0.52 | -6.7182000E-02 | 1.6424069E 05 |
| P1P4 | 164240.69 115.75 | 0.0000000E 00 | 2.4465217E 06 |
| P2P3 | 328424.73 237.46 | 6.7159700E-02 | 1.1862002E 02 |

K = 0.500083

Bumper A: 331939.56
Bumper B: -3184.95

CROSS SCAN conversion factor: 0.409urad/IFAR count
CROSS AXIS THERM DRIFT RATE: 0.06urad/min
CROSS SCAN linear term removed: 96.92urad

diff in K= 0.000002

data collection: 2; tape AT-FM, trk 0, file 5, rev 22681

Time at end of SCAN: 957.36 597.60
Time between Cal and Scan: 2.01min
CROSS AXIS DRIFT: (last P0 to SCAN): 0.12urad
CROSS AXIS REFERENCE OFFSET: 0.09urad

-----P0P5-----
Along Cross A-Octal-B
Avg 0.00 -0.22 Minutes: 598.83
Sigma 0.00 0.70

-----BUMPER B-----
Along Cross A-Octal-B
Avg -3187.00 -2.00 Minutes: 599.52
Sigma 0.00 0.00

-----P1P2-----

A-Octal-B

Sigma 0.34 0.66

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-----BUMPER A-----

| Along | Cross | A-Octal-B | Minutes: |
|---------------|--------|-----------|----------|
| Avg 331938.00 | 239.00 | | 600.33 |
| Sigma 0.00 | 0.00 | | |

-----P2P3-----

| Along | Cross | A-Octal-B | Minutes: |
|---------------|--------|-----------|----------|
| Avg 328424.00 | 236.48 | | 600.62 |
| Sigma 0.00 | 0.70 | | |

-----P0P5-----

| Along | Cross | A-Octal-B | Minutes: |
|------------|-------|-----------|----------|
| Avg 0.42 | -0.05 | | 601.28 |
| Sigma 0.49 | 0.60 | | |

Along Scan Calibration
Time at end of Cal: 1001.17

| Acct | IFAR Counts | Preset Angles | No. a, b |
|------|------------------|----------------|----------------|
| P0P5 | 0.42 -0.05 | -6.7182000E-02 | 1.6423837E 05 |
| P1P4 | 164238.37 113.54 | 0.0000000E 00 | 2.4465285E 06 |
| P2P3 | 328424.12 236.53 | 6.7159700E-02 | -9.8598148E 02 |

K = 0.500079

Bumper A: 331938.16
Bumper B: -3186.69

CROSS SCAN conversion factor: 0.409urad/IFAR count
CROSS AXIS THERM DRIFT RATE: 0.03urad/min
CROSS SCAN linear term removed: 96.77urad

d f in K = 0.500079

-----P0P5-----

| Along | Cross | A-Octal-B | Minutes: |
|------------|-------|-----------|----------|
| Avg 0.00 | 0.00 | | 601.90 |
| Sigma 0.00 | 0.00 | | |

-----BUMPER B-----

| Along | Cross | A-Octal-B | Minutes: |
|--------------|-------|-----------|----------|
| Avg -3187.00 | -1.70 | | 602.32 |
| Sigma 0.00 | 0.47 | | |

-----P1P2-----

| Along | Cross | A-Octal-B | Minutes: |
|---------------|--------|-----------|----------|
| Avg 164237.69 | 114.47 | | 602.70 |
| Sigma 0.46 | 0.50 | | |

-----BUMPER A-----

| Along | Cross | A-Octal-B | Minutes: |
|---------------|--------|-----------|----------|
| Avg 331937.00 | 239.00 | | 603.15 |
| Sigma 0.00 | 0.00 | | |

-----P2P3-----

Along Cross A-C Minutes: 603.37
Avg 328423.00 235.55
Sigma 0.00 0.67

-----P0P5-----

Along Cross A-Octal-B Minutes: 603.95
Avg -1.00 -1.34
Sigma 0.00 0.73

Along Scan Calibration
Time at end of Cal:1003.57

| Facet | IFAR Counts | | Preset Angles | No,a,b |
|-------|-------------|--------|----------------|----------------|
| P0P5 | -1.00 | -1.34 | -6.7182000E-02 | 1.6423708E 05 |
| P1P4 | 104237.08 | 113.65 | 0.0000000E 00 | 2.4465286E 06 |
| P2P3 | 328422.72 | 235.17 | 6.7159700E-02 | -8.7926390E 02 |

K = 0.500000

Bumper A: 331936.61
Bumper B: -3187.80

CROSS SCAN conversion factor: 0.409urad/IFAR count
CROSS AXIS THERM DRIFT RATE: 0.27urad/min
CROSS SCAN linear term removed: 96.74urad

diff in K= 0.000000

data collection: 2:tapeAT-FM, trk0, file5, rev22681

Time at end of SCAN:1004.48 604.80
Time between Cal and Scan: 0.91min
CROSS AXIS DRIFT:(last P0 to SCAN):-0.24urad
CROSS AXIS REFERENCE OFFSET:-0.79urad

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Chamber Pressure (torr): 0.72

Temperatures and Voltages

| Ch | Scanner Out | Device | Cal | Measurement |
|----|-------------|------------|-----|----------------|
| 0 | -1.0300E 04 | QUARTER | 3 | ERROR |
| 1 | 2.3321E-02 | EU=6.8I | 5 | 2342.100 mAmps |
| 2 | 5.050E-03 | EU=+27I | 5 | 30.100 mAmps |
| 3 | -1.2910E-03 | EU=-27I | 5 | 25.620 mAmps |
| 4 | 2.0051E 03 | SMA -Z | 1 | 24.942 Deg C |
| 5 | 1.9482E 03 | SMA -X | 1 | 25.756 Deg C |
| 6 | 1.9162E 03 | SMA +Z | 1 | 26.216 Deg C |
| 7 | 1.9788E 03 | SMA +X | 1 | 25.318 Deg C |
| 8 | 1.9713E 03 | TORG, BRDG | 1 | 25.426 Deg C |
| 9 | 0.2892E 02 | SME TEMP | 2 | 29.930 Deg C |
| 10 | 1.0707E 03 | SAM TEMP | 1 | 26.753 Deg C |
| 11 | 7.0890E 00 | EU=6.8V | 4 | 7.089 Volts |
| 12 | 9.0438E 03 | MF(-Z-X) | 3 | 24.638 Deg C |
| 13 | 9.0465E 03 | MF(+Z+X) | 3 | 24.615 Deg C |
| 14 | 2.5213E-01 | SME(1)TEL | 4 | 0.252 Volts |
| 15 | 4.3470E 00 | SME(2)TEL | 4 | 4.347 Volts |
| 16 | 1.0000E 04 | SME PR U7 | 3 | ERROR |
| 17 | 3.8614E 00 | SAM1/BMP2 | 4 | 3.861 Volts |
| 18 | 2.8888E 01 | EU=+27V | 4 | 28.888 Volts |
| 19 | -2.8826E 01 | EU=-27V | 4 | -28.826 Volts |

Data Tape Identifier: F1D8
 Track for Data: 1
 Init/Cal Data File Number: 15
 Scan Data File Number: 16
 Norm/Avg Scan Data File Number: 17
 Smoothing Coeffs File Number: 18

=====

IF 'ERROR' 48 OCCURS DURING MARKING OF TAPE:

type: to REMARK---press execute---press continue

=====

Date: 031001 Time: 0950

```
data tape identifier:          F1D8
track for data:                1
INIT/CAL data file number:    15
SCAN data file number:        16
NORM/AVG SCAN data file number: 17
Smoothing Coeffs file number: 18
```

mode selected: NORM

Data Date: 031081 Data Time: 0950

SAM MODE operation

scan N: 1 no. of words transferred = 837

```
Line Length,N-1:      377 100 016 000
Active Scan Time,N-1: 60742.62
Final Time,N:         60743.20
```

TELEMETRY

| Byte No | Name | Contents | Pulses | Time(usec) |
|----------|------------|-------------|----------------------------|------------|
| 1 | SYNC | 006 | | |
| 2 | OPSTAT N | 106 | Bit 7 = 0: Scan N= Forward | |
| 3 | SCNLIN N | 130 | 88 | 16.58 |
| 4 5 | TRNERR N | 003 331 | 985 | 185.62 |
| 6 7 | TORPLS N | 360 207 | -3961 | -746.45 |
| 8 9 | SHSERR N-1 | 377 364 | -12 | -2.26 |
| 10 11 | FHSERR N-1 | 000 016 | 14 | 2.64 |
| 12 13 14 | SUMERR N-1 | 377 360 206 | -3962 | -746.64 |
| 15 16 | SCNCTR | 000 170 | | |
| 17 | SCNLIN N-1 | 250 | -88 | -16.58 |
| 18 19 | TRNERR N-1 | 001 176 | 382 | 71.99 |
| 20 21 | TORPLS N-1 | 357 362 | -4110 | -774.53 |
| 22 23 | SHSERR N-2 | 000 020 | 16 | 3.02 |
| 24 25 | FHSERR N-2 | 377 360 | -16 | -3.02 |
| 26 27 28 | SUMERR N-2 | 377 357 362 | -4110 | -774.53 |
| 29 30 31 | SCNCTR | 000 053 051 | 382 389 | 74.91 |
| 32 33 34 | SCNCTR | 005 | 382 389 | 74.91 |

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scan N: 2 no. of words transferred = 832

Line Length, N-1: 001 017 361 377
Active Scan Time, N-1: 60742.81
Final Time, N: 60742.73

TELEMETRY

| Byte No | Name | Contents | Pulses | Time(used) |
|---------|------------------|-------------|----------------------------|--------------|
| 1 | SYNC | 246 | | |
| 2 | OPSTAT N | 306 | | |
| 3 | SCNLIN N | 250 | Bit 7 = 1: Scan N= Reverse | |
| 4 | 5 TRNERR N | 001 200 | -88 | -16.58 |
| 6 | 7 TORPLS N | 357 363 | 384 | 72.36 |
| 8 | 9 SHSERR N-1 | 000 020 | -4109 | -774.34 |
| 10 | 11 FHSERR N-1 | 377 361 | 16 | 3.02 |
| 12 | 13 14 SUMERR N-1 | 377 357 363 | -15 | -2.83 |
| 15 | 16 SCNCTR | 000 171 | -4109 | -774.34 |
| 17 | 17 SCHLIN N-1 | 130 | 88 | 16.58 |
| 18 | 19 TRNERR N-1 | 003 331 | 983 | 195.62 |
| 20 | 21 TORPLS N-1 | 360 207 | -3961 | -746.45 |
| 22 | 23 SHSERR N-2 | 377 364 | -12 | -2.26 |
| 24 | 25 FHSERR N-2 | 000 016 | 14 | 2.64 |
| 26 | 27 28 SUMERR N-2 | 377 360 206 | -3962 | -746.64 |
| 29 | 30 31 SCNTYM N-2 | 004 353 027 | 322327 | 60742.64 |
| 32 | NSCANS | 037 | No.Scans = | 31 (decimal) |

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DATA SHEET 4.3.4-1
SCAN PROFILES
ALONG SCAN

TS 32015-004
8 March 1980

SMA Designation **F-1 ENG DATA**
T2 T3 T4 T5 T6 T7 T8 T9
26.3 25.1 25.4 25.9 25.6 26.9 32.3 24.7

BUFFER MODE
SW 4

SME (1) or (2) **2** **28.9-28.8 7.1**
(Nominal Voltages)

SAM ANGLES
USED (MRAD) **-57.2 57.2**
IFAR COUNTS **8.50077**
CALIBRATION

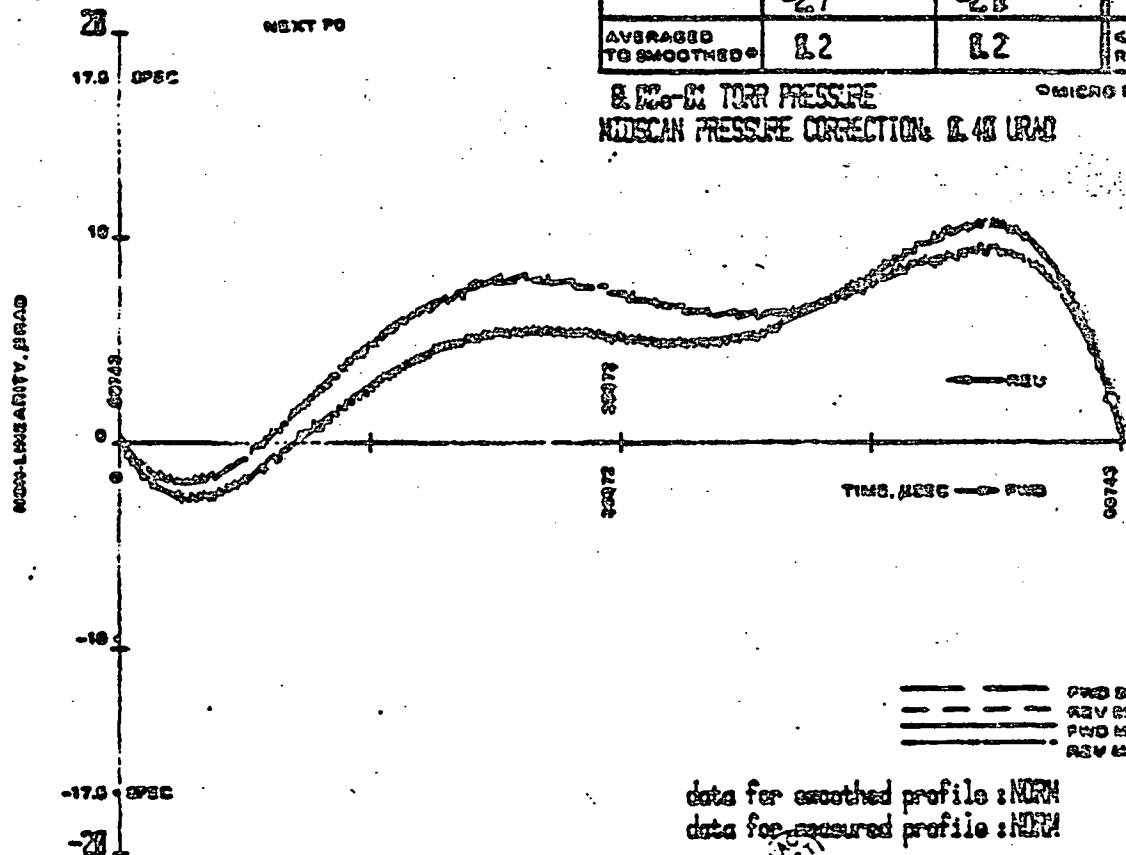
PAST SCAN

BUMPER A
P2 P3

MD P1 P4 FROM TFEG RUN 31681.1011
PO P5

BUMPER B
OFFSET-CORRECTED SCAN ANGLES (REF PO), MRAD:

P2 P3
P1 P4
P5



0.02-0.01 TORR PRESSURE
NOISESCAN PRESSURE CORRECTION: 0.40 MRAD

Run No. **31681.1011**
Test Flow Event **H-15** seq **7**
Comments **test no 15**

QA Stamp **EST** Date **31081**
Tested By **S**

367

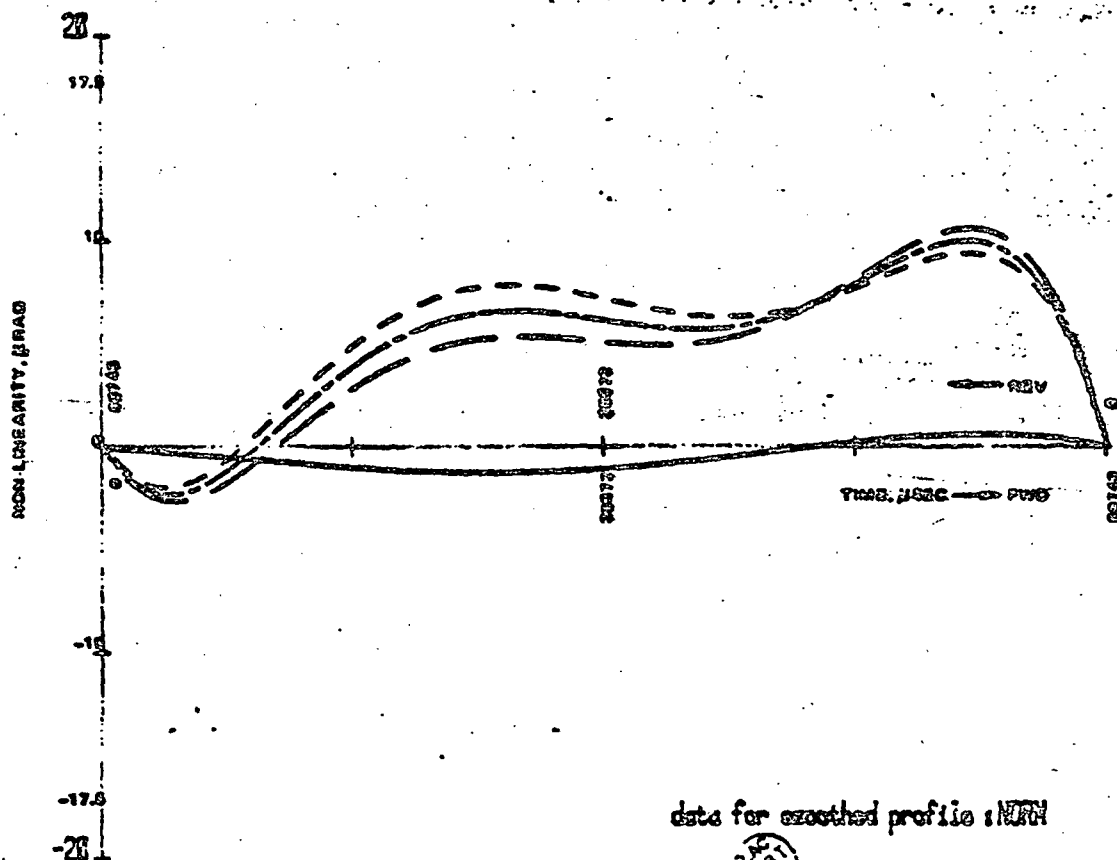
02 97701

BUFFER HOME
STN

SME (1) or (2) 2
(Nominal Voltages)

289-288 7.1

TWO SMOOTHED
 REV SMOOTHED
 NESTED, SMOOTHED
 NON-NESTED SMOOTHED



data for smoothed profile : NURN

QA Stamp

Page 31291

Tested By

Commons test no. 15

NO. REC'D -
VELLUM

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TS 32015-004
8 March 1980

DATA SHEET 4.3.4.3
SCAN PROFILES
BAND TO BAND REGISTRATION

SMA Designation F-1 ENG DATA

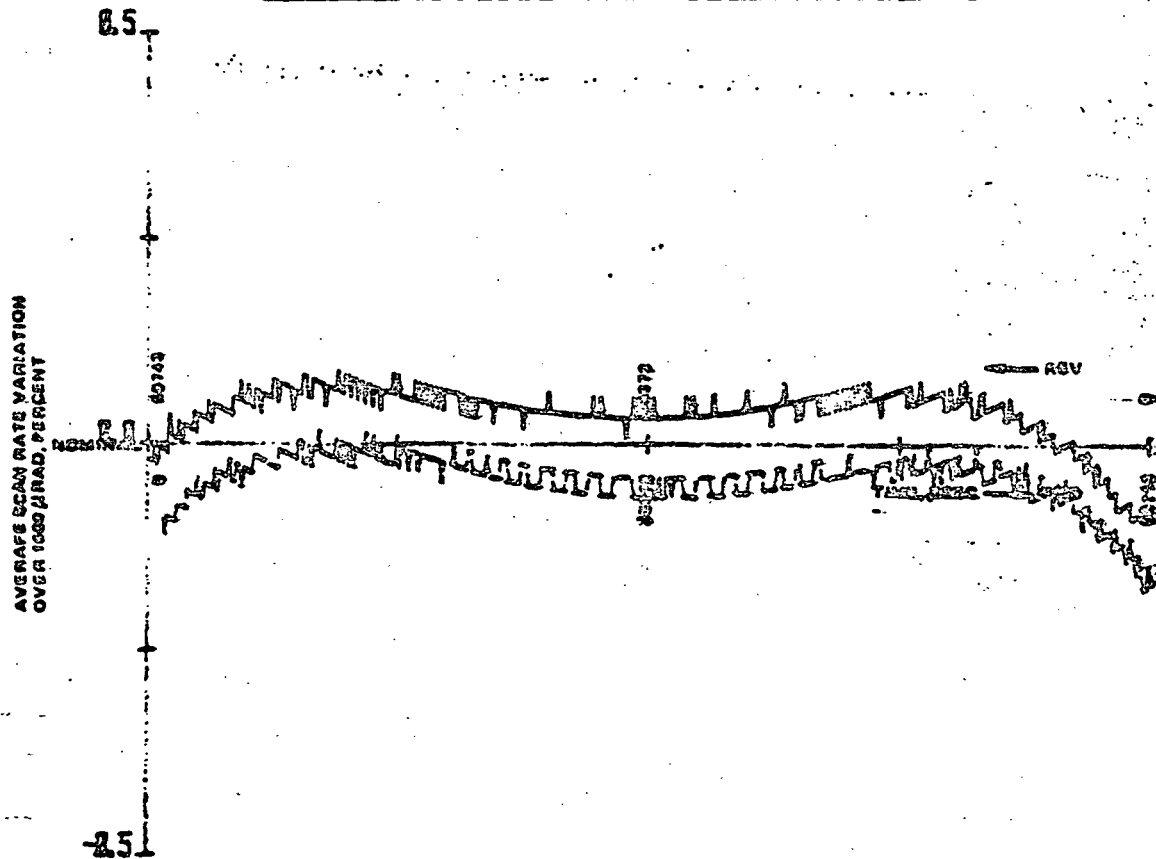
BLMPER NODE
S/N 4

SRE (1) or (2)
(Measured Voltage)

BAND SEPARATION = 75.8 IFV (1678.2 RAD) 28.9-28.8 7.1

| | FWD | REV | SPEC | P/P |
|--|-------|-------|-----------------|-----------------|
| PEAK AVG SCAN RATE | 0.602 | 0.177 | XXXX | XXXX |
| AVG SCAN RATE
(50% OF SCAN)
LESS THAN: | 0.572 | 0.078 | + .0345 | P |

FWD _____
REV _____



data used for computations = RAW

Run No. 31231.1011

Test Flow Event H-15 seq 7.0000

Comments test no. 15

QA Stamp



Date

3/10/81

Tested By

[Signature]

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DATA SHEET 4.1.4.4
SCAN PROFILES
CROSS SCAN
BUMPER NOISE

TS 32015-004
8 March 1980

SMA Designation F-1 ENG DATA

S/N 4

USE (1) or (2) 2 28.9 -28.8 7.1
(Nominal Voltages)

FORWARD LINEAR TERM
REMOVED TO CORRECT FOR
IPAC ALIGNMENT ERROR TERM
- FWD TERM: 97.00 UFGU

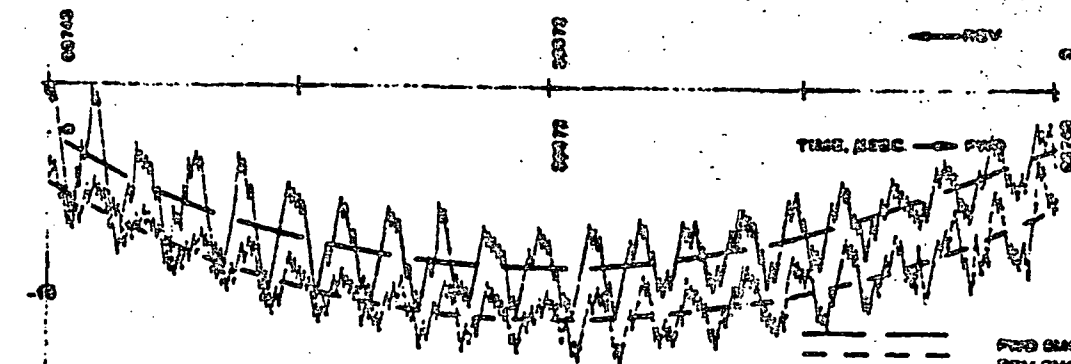
SMOOTHING POLYNOMIAL COEFFICIENTS

| ORDER (N) | FWD | REV | PGC | PA |
|--------------------------|-------------|-------------|-----|----|
| 0 | -8.8671e-07 | -1.4473e-05 | | |
| 1 | -1.3033e-04 | -1.0187e-04 | | |
| 2 | 4.2157e-03 | 2.4970e-03 | | |
| 3 | -9.3982e-02 | -3.6994e-02 | | |
| 4 | 1.6266e-01 | 5.8893e-01 | | |
| 5 | -1.0634e-01 | -2.9295e-01 | | |
| REFLECTION
POINTS | 1 | 8 | | |
| MAX + | -2.6 | -1.2 | | |
| MIN - | -2.2 | -2.9 | | |
| AVERAGED
TO SMOOTHED* | 0.3 | 0.3 | | |

0.8 Torr Pressure

OPERATOR ADJUSTS
CHAPTER REMOVING LINEAR
IPAC-ALIGNMENT TERM



CROSS SCAN ANGLE, DEGR



FWD SMOOTHED**
REV SMOOTHED**
FWD MEASURED**
REV MEASURED**

data for smoothed profile: RAW
data for measured profile: RAW

Item No. 31281.1011
Test Floor Event H-15 seq 7
test no. 15
Comments

QA Stamp  Date 31281
Tested By 

C-5

NO. 3300-2
VOLUME

ORIGINAL PAGE 3
OF POOR QUALITY

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TS 32015-004
8 March 1980

DATA SHEET 4.3.4-6
SCAN PROFILES
CROSS SCAN

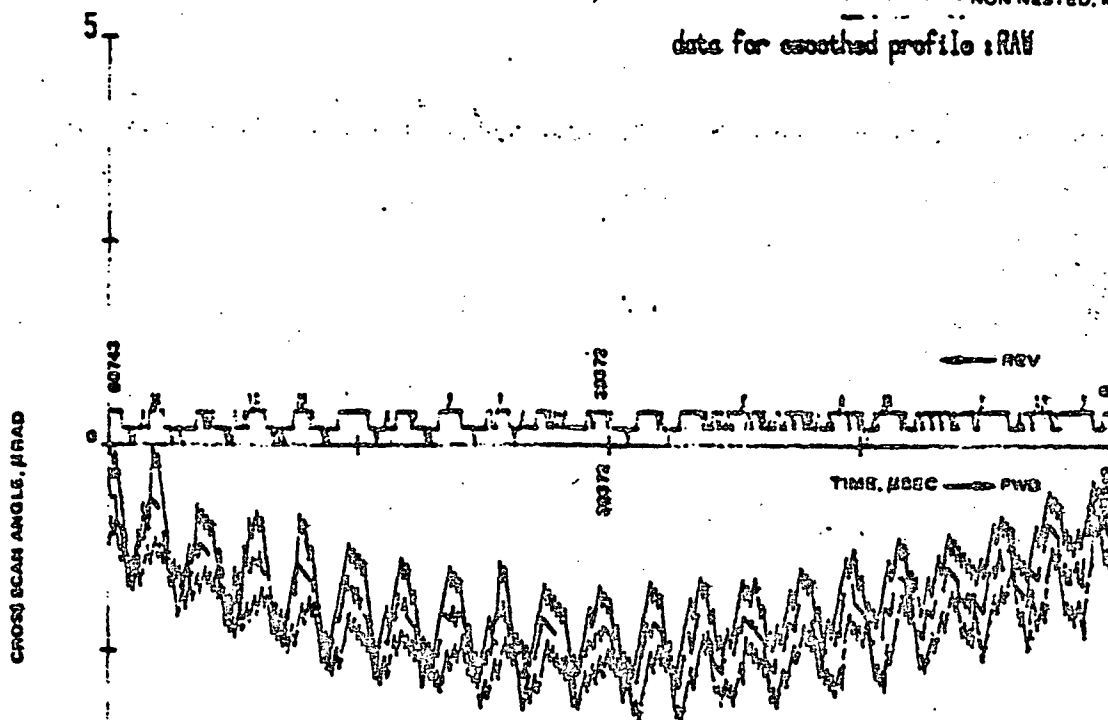
SMA Designation F-1 ENG DATA

BUMPER NOISE

SME (1) or (2) 2
(Nominal Voltages)
28.9 - 28.8 7.1

— FWD MEASURED
— REV MEASURED
— NESTED, MEASURED
— NON NESTED, MEASURED

data for smoothed profile: RAW



| OVERLAP - UNDERLAP | | |
|---|-------------|-----|
| FWD TO REV CROSS SCAN
PROFILE (2X NON-NESTED), RAD | CMSC | P/P |
| MAX = 1.23 | 62.1
RAD | - |

Run No. 31051.1811
Test Flow Event H-15 seq 7
Comments test no. 15

QA Stamp TEST 32 Date 31031
Tested By 5

NO. REQ'D
VOLUME

data collection: 110000AT-FM:trk0:file4:rev0023781

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=====TEST INITIAL CONDITIONS=====

1. Fans must be off for at least 20 min.
2. Both Lasers must be on at least 45 min
3. DTS temp (+Z+X) must be +/-1 deg from (-Z-X)
4. Chamber pressure must be less than 2 torr
5. Cross axis polarity correct

=====

Temperatures and Voltages

| Ch | Scanner Out | Device | Cal | Measurement |
|----|-------------|----------|-----|--------------|
| 4 | 2.0063E 03 | SMA -Z | 1 | 24.939 Deg C |
| 12 | 9.0418E 03 | MF(-Z-X) | 3 | 24.653 Deg C |
| 13 | 9.0437E 03 | MF(+Z+X) | 3 | 24.638 Deg C |

Date: 031081 Time: 1011

SP Designation: F-1 ENG DATA

Serial Number: 4

Run Number: 31081.1011

Test Flow Event: H

Test Number: 15

Sequence number: 7

INITIALIZE Words Transferred: 4

Word Number 0: INTERRUPT (Raw 177771 Octal)

| Bit | Description | Setting |
|-----|----------------|---------|
| 0 | Panel Mode | 1 |
| 1 | Calibrate Mode | 0 |
| 2 | Scan Mode | 0 |

Word Number 1: PANEL STATUS (Raw 042402 Octal)

| Bit | Description | Setting |
|-----|---------------------|---------|
| 0 | Bumper SW On | 0 |
| 1 | See SAM P0/P3 | 1 |
| 2 | See SAM P2/P5 | 0 |
| 3 | See SAM PA/PB | 0 |
| 45 | Processed SAM | 1 |
| 45 | Raw SAM | 0 |
| 45 | SAM 1 or SAM 2 | 0 |
| 45 | SAM 3 (CAL SAM) | 0 |
| 6 | Single Reset | 0 |
| 7 | End SAM P0/P3 | 0 |
| 8 | End SAM P2/P5 | 1 |
| 9 | End SAM PA/PE | 0 |
| 10 | Ext Reset | 1 |
| 11 | 5 Facet | 0 |
| 12 | Calibrate Mode | 0 |
| 13 | Scan Mode | 0 |
| 14 | Initialize Mode | 1 |
| 15 | Slow Telemetry Mode | 0 |

Word Numbers 2 and 3: (Raw 177633 057774 Octal)

| | | | |
|--------------------|------------|-----------------|-----|
| Scan Count Preset: | 7774 Octal | No. of Scans: | 3 |
| Time Count Preset: | 3774665 | No. of Samples: | 400 |

Number of Scans of S# Dimension: 3

Scans x Samples: 1200

Number of Samples plus 1: 401

Dimension of S# Array: 5018

Dimension of M# Array: 6

CALIBRATE: SAM: SNE: 2

-----POP5-----

| | | | |
|-------|-------|-----------|--------|
| Along | Cross | A-Octal-B | |
| 0.25 | 0.00 | Minutes: | 612.48 |
| 1990 | 0.44 | 0.00 | |

-----BUMPER B-----

| | | | |
|--------------|-------|-----------|--------|
| Along | Cross | A-Octal-B | |
| Avg -3187.00 | -2.00 | Minutes: | 612.87 |
| Sigma 0.00 | 0.00 | | |

-----P1P2-----

| | | | |
|---------------|--------|-----------|--------|
| Along | Cross | A-Octal-B | |
| Avg 164233.00 | 114.64 | Minutes: | 613.13 |
| Sigma 0.40 | 0.48 | | |

-----BUMPER A-----

| | | | |
|---------------|--------|-----------|--------|
| Along | Cross | A-Octal-B | |
| Avg 331941.00 | 240.00 | Minutes: | 613.55 |
| Sigma 0.00 | 0.00 | | |

-----P2P3-----

| | | | |
|---------------|--------|-----------|--------|
| Along | Cross | A-Octal-B | |
| Avg 328424.00 | 235.64 | Minutes: | 613.75 |
| Sigma 0.40 | 0.48 | | |

-----POP5-----

| | | | |
|------------|-------|-----------|--------|
| Along | Cross | A-Octal-B | |
| Avg -0.30 | 0.44 | Minutes: | 614.32 |
| Sigma 0.40 | 0.50 | | |

Along Scan Calibration
Time at end of Cal: 1014.19

| Facet | IFAR Counts | Preset Angles | No. a, b |
|-------|------------------|----------------|----------------|
| POP5 | -0.39 0.44 | -6.7182000E-02 | 1.6423796E 05 |
| P1P4 | 164237.96 114.92 | 0.0000000E 00 | 2.4465368E 06 |
| P2P3 | 328424.42 236.78 | 6.7159700E-02 | -1.1261423E 03 |

K = 0.500079

Bumper A: 331940.73
Bumper B: -3187.51

CROSS SCAN conversion factor: 0.409urad/IFAR count
CROSS AXIS THERM DRIFT RATE: 0.10urad/min
CROSS SCAN linear term removed: 96.68urad

diff in K= 0.500079

-----POP5-----

| | | | |
|------------|-------|-----------|--------|
| Along | Cross | A-Octal-B | |
| Avg 0.00 | 0.00 | Minutes: | 614.85 |
| Sigma 0.00 | 0.00 | | |

-----BUMPER B-----

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0.00
-----F1P2-----
Along Cross A-Octal-B
Avg 164237.40 116.48 Minutes: 615.62
Sigma 0.50 0.51

-----BUMPER A-----
Along Cross A-Octal-B
Avg 331938.82 242.00 Minutes: 616.02
Sigma 0.00 0.00

-----F2P3-----
Along Cross A-Octal-B
Avg 328423.11 238.56 Minutes: 616.22
Sigma 0.31 0.54

-----P0P5-----
Along Cross A-Octal-B
Avg -0.44 1.85 Minutes: 616.82
Sigma 0.50 0.44

Along Scan Calibration
Time at end of Cal: 1016.49

| Facet | IFAR Counts | Preset Angles | No. a, b |
|-------|------------------|----------------|----------------|
| P0P5 | -0.44 1.85 | -5.7182000E-02 | 1.6423716E 05 |
| F1P4 | 164237.16 117.60 | 0.0000000E 00 | 2.4463339E 06 |
| F2P3 | 328423.97 239.12 | 6.7159700E-02 | -1.6202109E 03 |

K = 0.500077

Bumper A: 331938.82
Bumper B: -3188.34

CROSS SCAN conversion factor: 0.409urad/IFAR count
CROSS AXIS THERM DRIFT RATE: 0.38urad/min
CROSS SCAN linear term removed: 97.06urad

diff in K= 0.000002

data collection: 2:tapeAT-FM, trk0, file5, rev22631

Time at end of SCAN: 1017.38 617.63
Time between Cal and Scan: 0.89min
CROSS AXIS DRIFT: (last P0 to SCAN): 0.34urad
CROSS AXIS REFERENCE OFFSET: 1.10urad

Time at end of SCAN: 1017.47 617.78
Time between Cal and Scan: 0.98min
CROSS AXIS DRIFT: (last P0 to SCAN): 0.38urad
CROSS AXIS REFERENCE OFFSET: 1.13urad

Time at end of SCAN: 1017.54 617.90
Time between Cal and Scan: 1.05min
CROSS AXIS DRIFT: (last P0 to SCAN): 0.40urad
CROSS AXIS REFERENCE OFFSET: 1.16urad

Time at end of SCAN: 1018.01 618.01

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099 AXIS DRIFT: (last P0 to SCAN): 0.58urad
099 AXIS REFERENCE OFFSET: 1.34urad

Number Pressure (torr): 0.80

temperatures and Voltages

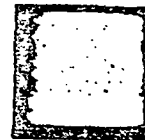
| Ch | Scanner Out | Device | Cal | Measurement |
|----|-------------|-----------|-----|----------------|
| 0 | -1.0000E 04 | QUARTER | 3 | ERROR |
| 1 | 2.2486E-02 | EU=6.81 | 5 | 2248.600 mAmps |
| 2 | 1.4910E-03 | EU=+27I | 5 | 29.820 mAmps |
| 3 | -1.2880E-03 | EU=-27I | 5 | 25.760 mAmps |
| 4 | 1.9988E 03 | SMA -Z | 1 | 25.032 Deg C |
| 5 | 1.9403E 03 | SMA -X | 1 | 25.870 Deg C |
| 6 | 1.9000E 03 | SMA +Z | 1 | 26.333 Deg C |
| 7 | 1.9599E 03 | SMA +X | 1 | 25.445 Deg C |
| 8 | 1.9590E 03 | TORQ BRDG | 1 | 25.602 Deg C |
| 9 | 0.1957E 02 | SME TEMP | 2 | 30.273 Deg C |
| 10 | 1.8860E 03 | SAM TEMP | 1 | 26.934 Deg C |
| 11 | 7.0889E 00 | EU=6.8V | 4 | 7.088 Volts |
| 12 | 9.0354E 03 | MF(-Z-X) | 3 | 24.703 Deg C |
| 13 | 9.0386E 03 | MF(+Z+X) | 3 | 24.678 Deg C |
| 14 | 2.5214E-01 | SME(1)TEL | 4 | 0.252 Volts |
| 15 | 4.3471E 00 | SME(2)TEL | 4 | 4.347 Volts |
| 16 | -1.0000E 04 | SME PR U7 | 3 | ERROR |
| 17 | 3.8623E 00 | SAM1/BMP2 | 4 | 3.862 Volts |
| 18 | 2.8889E 01 | EU=+27V | 4 | 28.889 Volts |
| 19 | -2.8827E 01 | EU=-27V | 4 | -28.827 Volts |

Data Tape Identifier: F1D3
Track for Data: 1
Init/Cal Data File Number: 19
Scan Data File Number: 20
Norm/Avg Scan Data File Number: 21
Smoothing Coeffs File Number: 22

=====

IF 'ERROR' 48 OCCURS DURING MARKING OF TAPE:
type:to REMARK---press execute---press continue

=====



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TELEMETRY PRINTOUT, 1: tapeAT-F, trk0, file15, rev22381

Date: 031081 Time: 1011

Designation: F-1 ENG DATA
Serial Number: 4
Run Number: 31081.1011
Test Flow Event: H
Test Number: 15
Sequence Number: 7

data tape identifier: F108
track for data: 1
INITIAL data file number: 19
SCAN data file number: 20
NO. AVG SCAN data file number: 21
Smoothing Coeffs file number: 22

Mode selected: NORM

TELEMETRY PRINTOUT, 2: tapeAT-F, trk0, file16, rev22381

Data Date: 031081 Data Time: 1011

BUFFER MODE operation

scan N: 1 no. of words transferred = 837

Line Length-N: 005 306 316 000
Buffer to Buffer Time-N: 71342.4
Final Time-N: 60743.11

TELEMETRY

| Byte No | Name | Contents | Pulses | Time(usec) |
|---------|---------------|-------------|--------|------------|
| 1 | SUNC | 246 | | |
| 2 | OPSTAT N | 146 | | |
| 3 | SONLIN N | 130 | 88 | 16.58 |
| 4 | 5 TRNERR N | 000 000 | 0 | 0.00 |
| 5 | 7 TORPLS N | 355 170 | -4744 | -894.01 |
| 8 | 9 SHSERR N-1 | 000 000 | 0 | 0.00 |
| 10 | 11 FHSERR N-1 | 000 000 | 0 | 0.00 |
| 13 | 14 SUMERR N-1 | 377 355 167 | -4745 | -894.20 |
| 15 | 16 SONCTR | 000 376 | | |
| 17 | SONLIN N-1 | 250 | -88 | -16.58 |
| 18 | 19 TRNERR N-1 | 000 000 | 0 | 0.00 |
| 20 | 21 TORPLS N-1 | 357 153 | -4245 | -799.97 |
| 22 | 23 SHSERR N-2 | 000 000 | 0 | 0.00 |
| 24 | 25 FHSERR N-2 | 000 000 | 0 | 0.00 |
| 27 | 28 SUMERR N-2 | 377 357 000 | -4352 | -820.14 |
| 30 | 31 SONTYM N-2 | 004 353 033 | 322331 | 60743.39 |
| 32 | NO SCANS | 162 | | |

No. Scans = 114 (decimal)

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scan #: 2 no. of words transferred = 832

Line Length, N-1: 005 306 316 377
Bumper to Bumper Time, N-1: 71342.4
Final Time, N: 60743.11

TELEMETRY:

| Ext | No | Name | Contents | Pulses | Time(used) |
|-----|----|------------|-------------|----------------------------|--------------|
| | 1 | SYNC | 246 | | |
| | 2 | OPSTAT N | 346 | Bit 7 = 1: Scan N= Reverse | |
| | 3 | SCHLIN N | 250 | -88 | -16.58 |
| | 4 | TRNERR N | 000 000 | 0 | 0.00 |
| | 5 | TORPLS N | 357 157 | -4241 | -799.22 |
| | 6 | SHSERR N-1 | 000 000 | 0 | 0.00 |
| | 7 | PHSERR N-1 | 000 000 | 0 | 0.00 |
| 12 | 13 | SUMERR N-1 | 377 357 156 | -4242 | -799.41 |
| | 15 | SCHCTR | 000 376 | | |
| | 17 | SCHLIN N-1 | 130 | 88 | 16.58 |
| | 18 | TRNERR N-1 | 000 000 | 0 | 0.00 |
| | 20 | TORPLS N-1 | 355 170 | -4744 | -894.01 |
| | 22 | SHSERR N-2 | 000 000 | 0 | 0.00 |
| | 24 | PHSERR N-2 | 000 000 | 0 | 0.00 |
| 26 | 27 | SUMERR N-2 | 377 355 167 | -4745 | -894.20 |
| 29 | 30 | SCHTYM N-2 | 004 353 026 | 322326 | 60742.45 |
| | 32 | NSCALC | 037 | No.Scans = | 31 (decimal) |

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Appendix B

Scan Mirror Assembly Acceptance Test Data

Part 18

Test Flow Event T

TS 32015-004

Scan Mirror Flatness

Static Flatness

Vertical axis

Dynamic Fitness

Vertical Axis

MTF Degradation

Indicate Fail if either Static or Dynamic flatness failed.

Horizontal Axis $\leq 3\%$ STATIC
Cross Section Axis $\leq 2\%$

| Spec | Value | Pass/
Fail |
|---------|--|---------------|
| 4.5uRAD | 1.05uRAD | P |
| | 0.95uRAD | P |
| 4.5uRAD | NOT TO BE
MEASURED AT
FLOW EVENT "T" | |
| (45%) | — | P |

Date 11 Mar 81 CA Stamp

Test Flow Events

Tested by

Comments

NO. REQ'D = 2

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S/N 005

10 Mar '81

TS 32015-004

101-4286

DATA SHEET 4.12-2
SCAN MIRROR STATIC FLATNESS

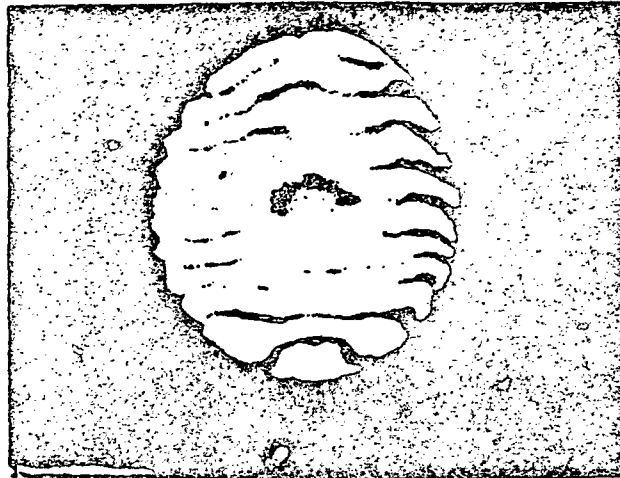
SMA Designation F-1

S/N 004

Scan Mirror 005

S/N 005

Scan Mirror Position: _____

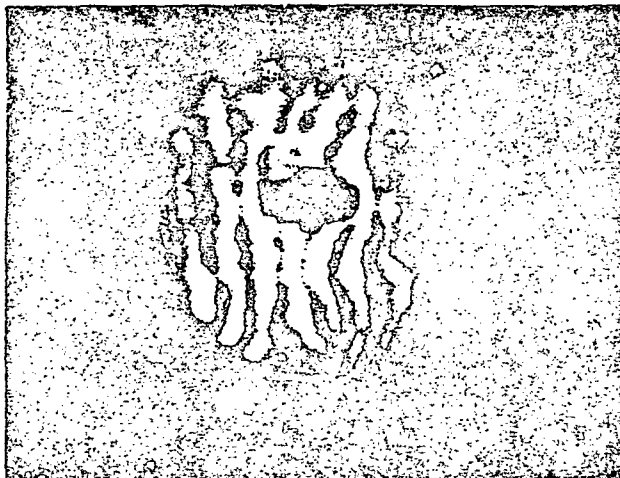


F-1 @ FRNG HORIZONTAL

HORIZONTAL
TEST
J2

S/N 005

10 Mar '81

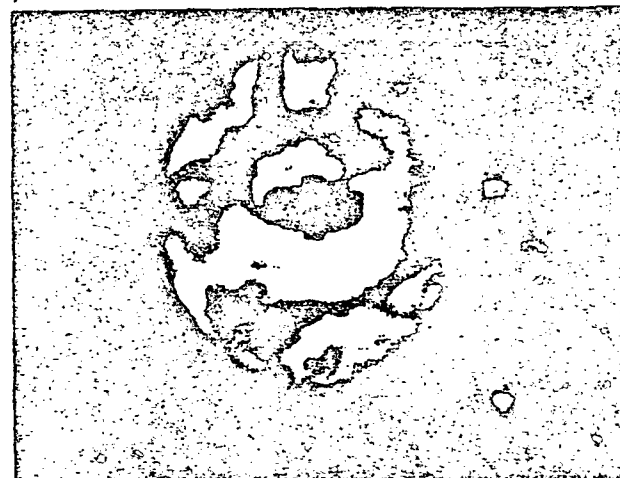


F-1 @ FRNG VERTICAL

VERTICAL
TEST
J2

S/N 005

10 Mar '81



F-1 ZERO NULL

ZERO
ORDER

TEST
J2

Date 11 Mar 81 QA Stamp T
Test Piece Event T
Comments _____
Tested By M. C. Wilson

REL. RAC 4-2

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Appendix B

Scan Mirror Assembly Acceptance Test Data

Part 19

Test Flow Event V

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TS 32015-202
Rev. 3

DATA SHEET 5.1-1
PREPARATION FOR DELIVERY

SMA Designation _____ S/N _____

1. Cleaning per 5.1 complete (✓) _____
2. Wear connectors included (✓) _____
3. Cables secured (✓) _____
4. Shock Indicators set (✓) _____

Date _____ by _____ QA Stamp _____

Comments _____

DATA SHEET 5.2-2

WORK SHEET FOR DATA SUMMARY CHART NO. 5.2-6

Fill in the data boxes for each test flow event from data sheet 4.3.5-2. SMA S/N 12-1 (4)

SWE (1) ☒ or (2) ☐

SAM MODE

| IFE LETTER | K | S | L | N | R |
|-------------------|---------|---------|---------|---------|---------|
| T_0
(-2-H) | 24.2 | 24.1 | 20.4 | 23.2 | 24.1 |
| Turnaround Time A | 10658.3 | 10651.7 | 10656.0 | 10653.5 | 10670.2 |
| Turnaround Time B | 10536.4 | 10542.5 | 10540.1 | 10539.8 | 10524.7 |

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TS 32015-067
224.3

WORK SHEET FOR DATA SUMMARY CHART NO. 5.2-7

SEE (1) ☒ or (2) _____

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TS 32015-004

| TYPE LETTER | H-6 | K | S | L | M | R | H-7 |
|----------------|--------|--------|--------|--------|--------|--------|--------|
| I | 28.4 | 31.4 | 29.6 | 26.9 | 35.1 | 30.9 | 29.2 |
| T ₀ | 24.3 | 24.2 | 24.1 | 20.4 | 28.3 | 24.0 | 24.4 |
| Diaper A | 35.0 | 35.0 | 35.43 | 35.20 | 35.63 | 35.78 | 35.27 |
| Diaper B | 31.29 | 31.74 | 31.79 | 31.63 | 32.25 | 31.51 | 32.15 |
| K | 500/05 | 500005 | 500005 | 500090 | 500089 | 500091 | 500091 |

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TS 32015-004

Rev. B

DATA SHEET 5.2-4

WORK SHEET FOR DATA SUMMARY CHART NO. 5.2-8

Fill in the data boxes for each Test Flow Event from data sheet 4.3.5-3. SWA S/N F-1 (4)

SHE (1) ☒ or (2) ☐

| TFE LETTER | H | K | S | L | N | R |
|---------------------------|---|-------|-------|-------|-------|-------|
| Fwd. midscan offset angle | | -3.33 | -3.33 | 2.16 | -6.67 | -2.16 |
| Rev. midscan offset angle | | 0.62 | 1.15 | -1.15 | 1.15 | 2.28 |
| Fwd. midscan ground corr. | | 3.25 | 2.74 | 5.10 | 7.10 | 4.41 |
| Rev. midscan ground corr. | | 0.47 | -0.47 | -1.55 | 1.01 | 2.14 |

DATA SHEET 6.2-5

WORK SHEET FOR DATA SUPPLY CHART NO. 6.2-9

Fill in the data boxes for each Test Flow Event from data sheet 4.3.6-3 SWS S/N F-1 (4)

SWE (1) ☒ SWE (2) ☐

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TS 32015-004

| TYPE LETTER | H-6 | K | S | L | N | R | H-7 |
|----------------|-----|-----|-----|-----|-----|-----|-----|
| P ₂ | 2.2 | 2.4 | 2.1 | 2.4 | 2.7 | 1.7 | 2.3 |
| P ₁ | 5.4 | 5.7 | 6.2 | 6.2 | 6.0 | 5.1 | 6.0 |
| P ₀ | 2.5 | 4.4 | 3.7 | 3.0 | 2.9 | 1.6 | 2.6 |
| P ₃ | 1.0 | 1.4 | 1.2 | 1.2 | 2.8 | 1.3 | 1.1 |
| P ₄ | 2.1 | 1.7 | 1.2 | 2.9 | 1.2 | 1.4 | 1.9 |
| P ₆ | 2.9 | 3.1 | 2.9 | 3.8 | 3.3 | 2.8 | 2.6 |

DATA SHEET 5.2-2

WORK SHEET FOR DATA SUMMARY CHART NO. 5.2-6

Fill in the data boxes for each test flow event from data sheet 4.3.5-2. SHA S/W F-1 (4)SPE (1) _____ or (2) ☒SAM MODE

| TYPE LETTER | K | S | L | H | R |
|--------------------------|--------|--------|--------|--------|--------|
| T _B
(-2-x) | 24.2 | 24.1 | 20.4 | 28.3 | 24.1 |
| Turnaround Time A | 106533 | 106489 | 106471 | 106506 | 106646 |
| Turnaround Time B | 106264 | 106308 | 106342 | 106278 | 106154 |

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Rev. 3

DATA SHEET 5.2-3

WORK SHEET FOR DATA SUMMARY CHART NO. 5.2-7

Fill in the data boxes for each Test Flow Event from data sheet 4.3.5-3. SNA S/N F1 (4)

SWE (1) _____ or (2) ☒

| THE LETTER | M-6 | K | S | L | B | R | H-7 |
|----------------|--------|--------|--------|--------|--------|--------|--------|
| T ₁ | 29.7 | 31.1 | 22.5 | 26.8 | 35.0 | 30.0 | 29.9 |
| T ₀ | 24.3 | 24.2 | 24.1 | 20.4 | 28.4 | 24.0 | 24.6 |
| Bumper A | 3528 | 3531 | 3525 | 3492 | 3548 | 3559 | 3514 |
| Bumper B | 3105 | 3148 | 3456 | 3152 | 3202 | 3133 | 3188 |
| K | 500091 | 500086 | 500078 | 500082 | 500075 | 500079 | 500080 |

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TS 32015-004

Page 3

DATA SHEET 5.2-4

WORK SHEET FOR DATA SUPPLY CHART NO. 5.2-8

Fill in the data boxes for each Test Flow Event from data sheet 4.3.5-3. SWA S/N F-1 (4)

SWE (1) or (2) ✓

| TEST LETTER | H | K | S | L | N | R |
|---------------------------|---|-------|-------|-------|-------|------|
| Fwd. midscan offset angle | | 4.87 | 5.00 | 6.81 | 1.79 | 7.20 |
| Rev. midscan offset angle | | 6.88 | 5.63 | 4.34 | 6.96 | 8.75 |
| Fwd. midscan ground corr. | | 1.69 | 1.81 | 3.63 | 51.38 | 4.01 |
| Rev. midscan ground corr. | | -1.11 | -1.18 | -2.48 | 0.14 | 1.93 |

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TS 32015-004

Rev. B

DATA SHEET 6.2-5

WORK SHEET FOR DATA SUPPLY CURVE NO. 5.2-9

Fill in the data boxes for each Test Flow Event from data sheet 4.3.5-3 SHA S/N F-1 (4)

SHE (1) _____ or (2) ☒

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TS 32015-004

| IFE LETTER | M-6 | K | S | L | H | B | N-7 |
|----------------|------|------|------|------|------|------|------|
| P ₂ | 2.5 | 2.3 | 2.8 | 3.9 | 2.3 | 2.6 | 3.0 |
| P ₁ | 4.3 | 2.7 | 4.1 | 3.5 | 3.5 | 3.1 | 4.5 |
| P ₀ | 2.0 | 2.9 | 3.1 | 2.5 | 4.9 | 1.2 | 1.6 |
| P ₃ | -1.6 | -2.1 | -1.8 | -2.2 | -0.6 | -1.6 | -1.9 |
| P ₄ | -2.2 | -2.0 | -1.5 | -0.5 | -1.2 | -1.3 | -0.9 |
| P ₆ | 0.4 | 0.2 | 0.6 | 1.0 | 5.2 | 0.5 | 0.4 |

DATA SHEET 5.2-10

Profile Data Summary (Test Flow Event V)

K_0 - θ Pop5
 θ P2P3 - θ Pop5

FORWARD Polynomial Coefficients REVERSE Polynomial Coefficients

| DATA | TapeTrack | File | PHIRO | b5 | | | | | b4 | | | | | b3 | | | | | b2 | | | | | b1 | | | | | b0 | | | | | PHIRO | SHE (1)
SUPER
MODE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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ORIGINAL PAGE IS
OF POOR QUALITY

NOTE: Obtain a_0 - a_5 , and b_0 - b_5 from data sheet 4.3.4-1; and PHIRO, PHIRO from data sheet 4.3.4-2
 Obtain "SAM ANGLES USED", θ Pop5, θ P2P3 from data sheet 4.3.4-1.

ORIGINAL PAGE IS
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DATA SHEET 5.2-C

TS 33015-00X
R.W.B

DATA SUMMARY CHART

TEMPERATURES AND TURN-AROUND TIMES

TEST
FLOW
EVENT

H K S L N R

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SMA DESIG. E-1

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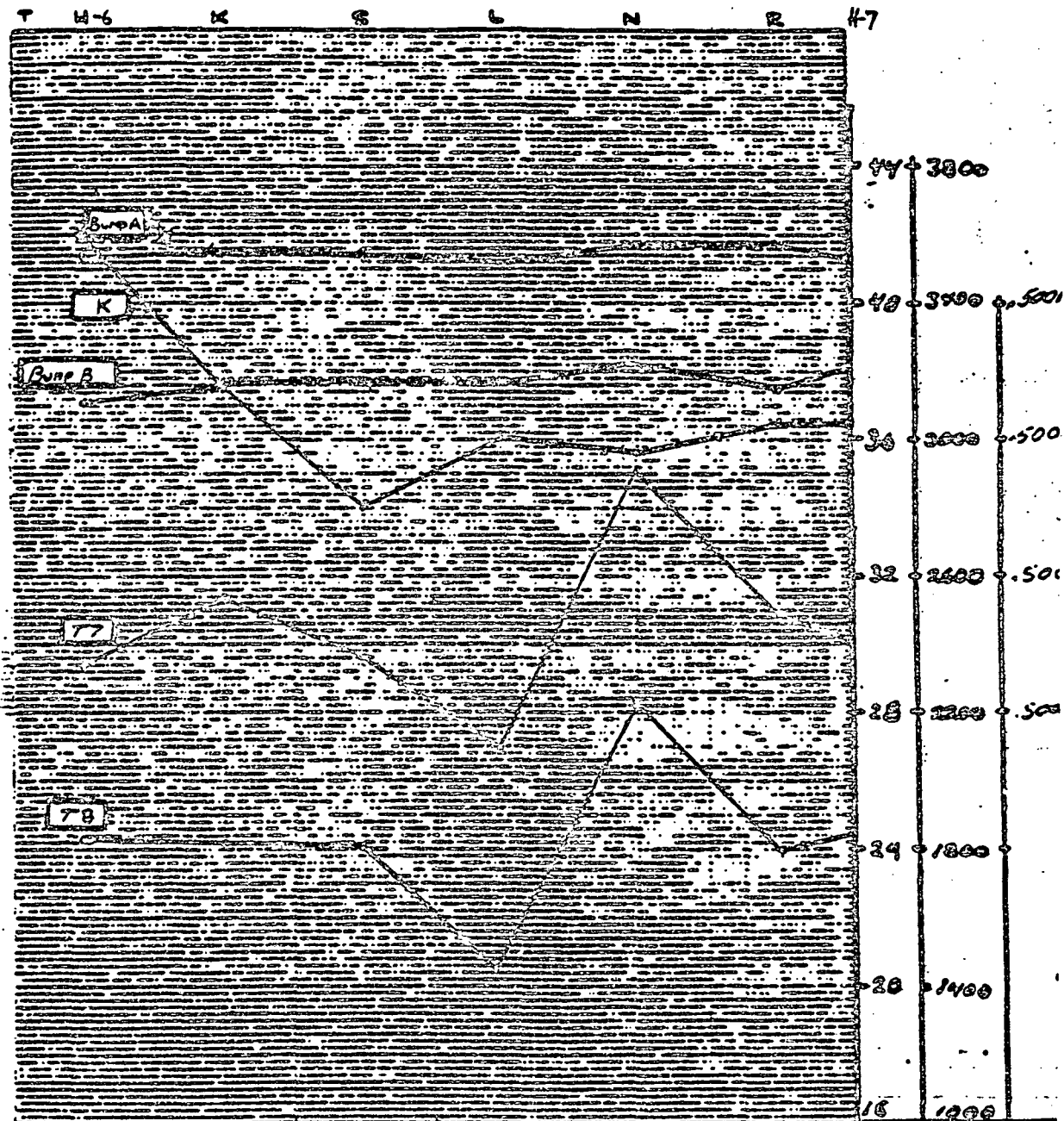
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TEST FLOW EVENT



SMA DESIG. F-1
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QA STAMP INS 53

PLOT AND LABEL
T7 (SHE TEMP)
T8 (-X-Z TEMP)
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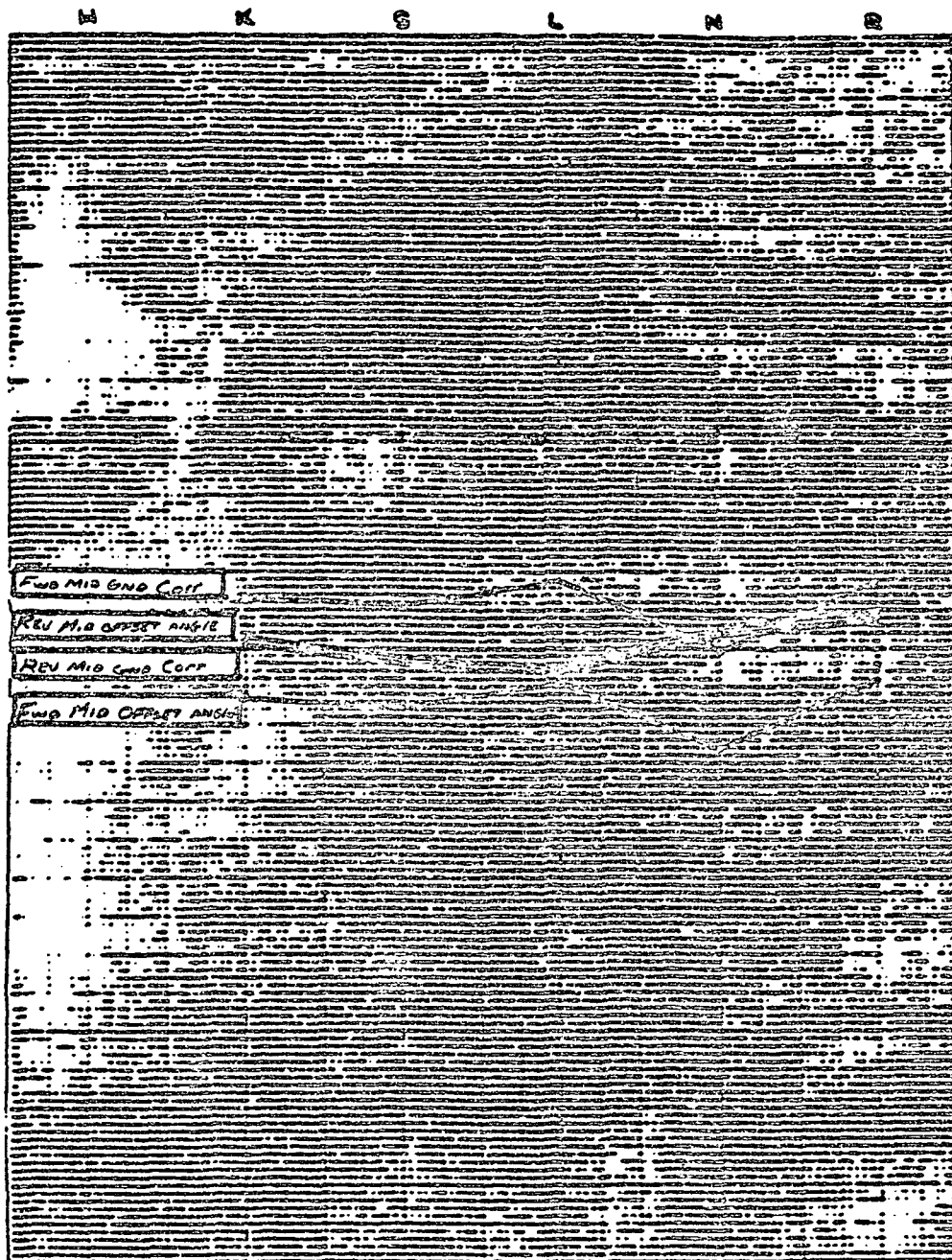
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DATA SHEET 3.2-6
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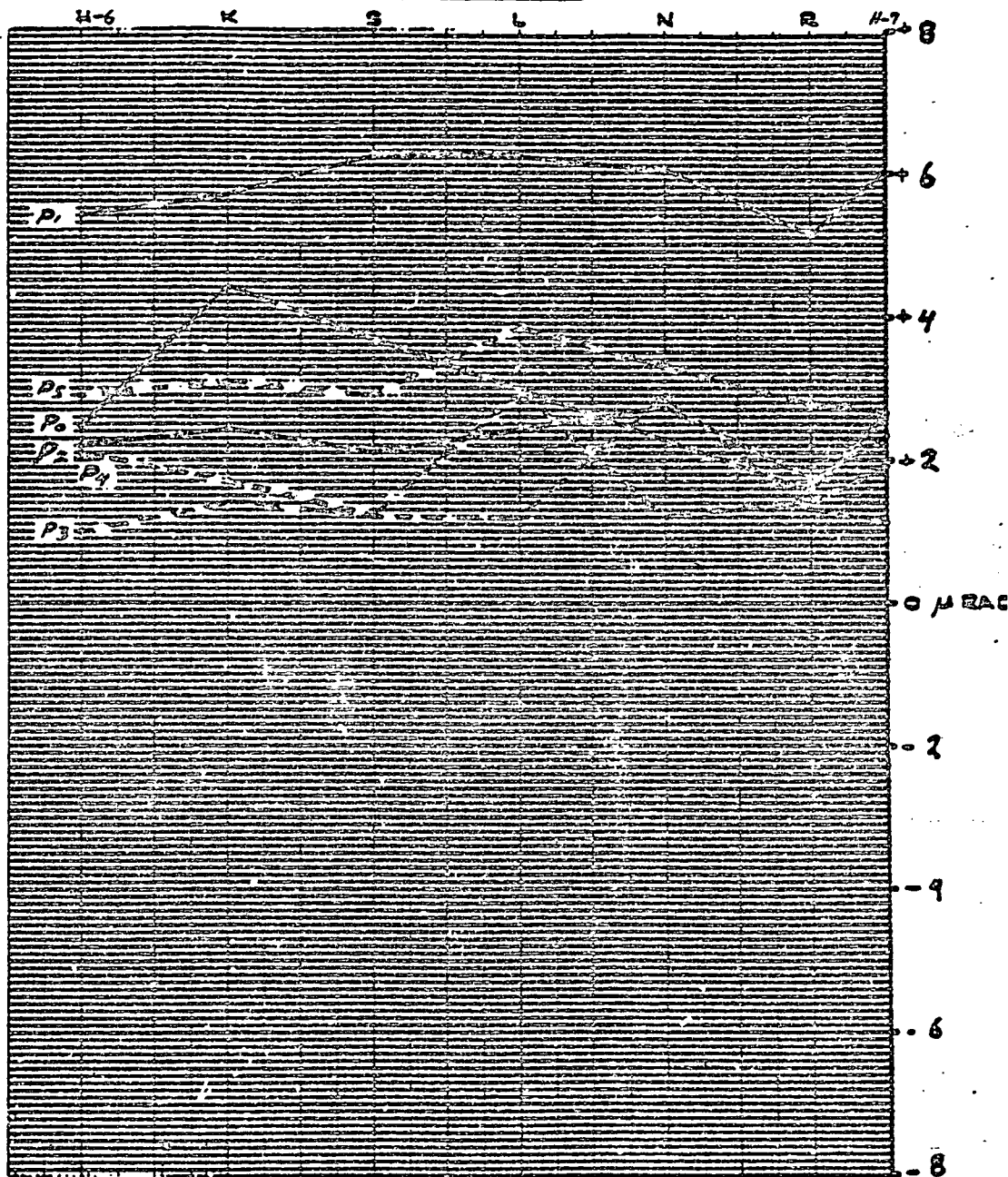
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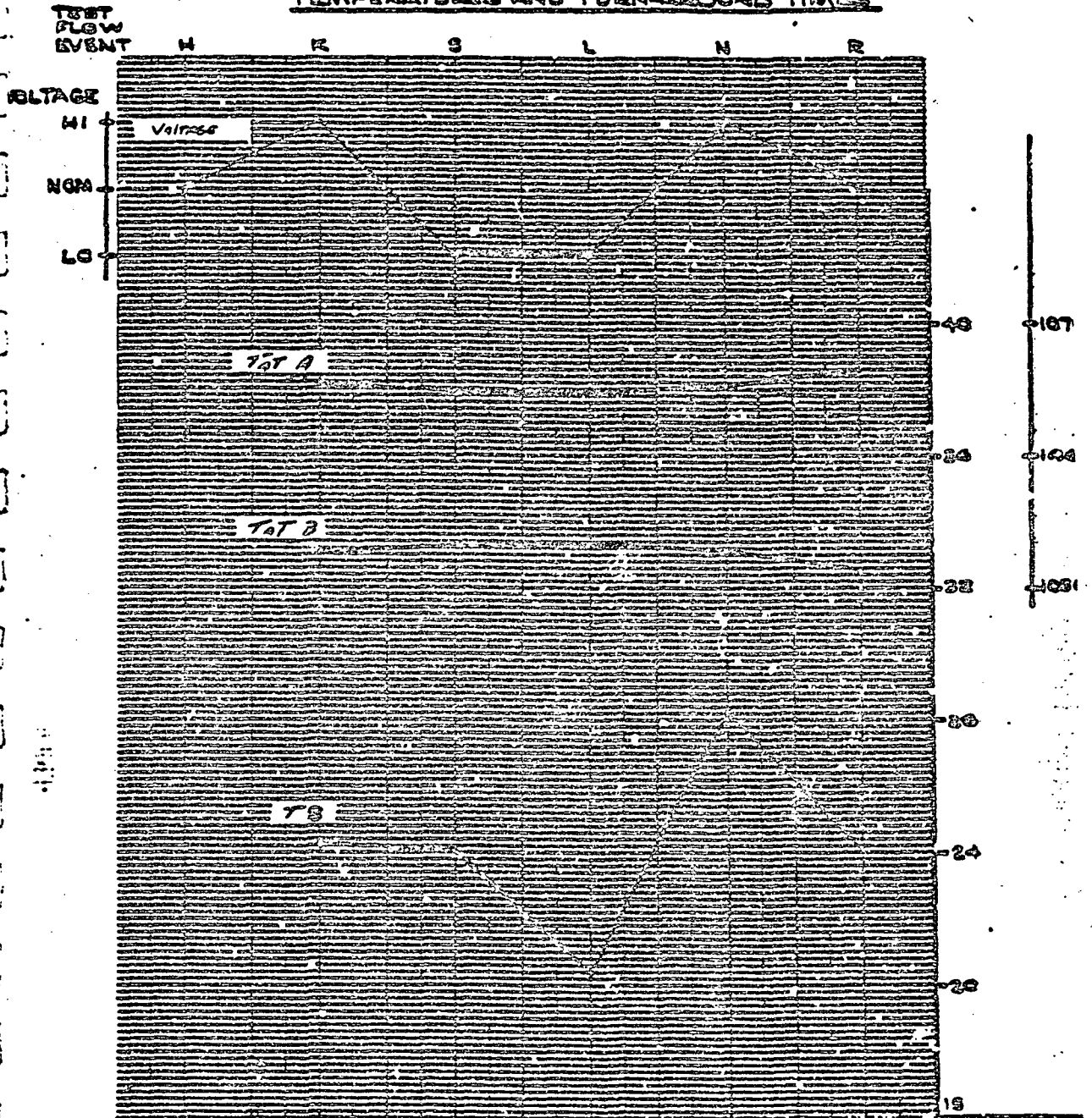
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ORIGINAL PAGE IS
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DATA SHEET 5.2-6

TS 33015-004
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DATA SUMMARY CHART
TEMPERATURES AND TURN-AROUND TIMES



SMA DESIG G-1

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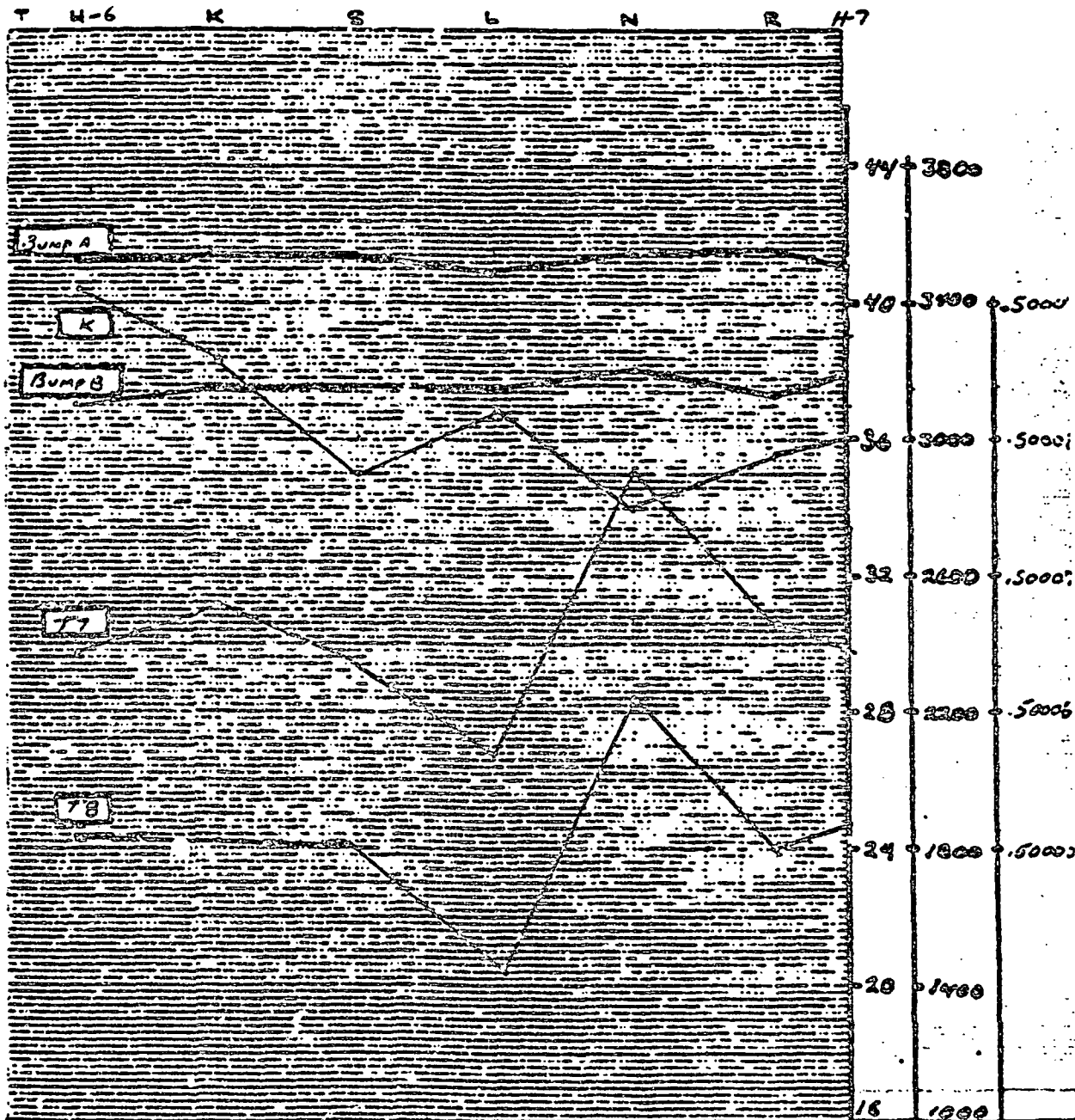
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R.W. 3

TEST FLOW EVENT



SMA DESIG. F1
SMA S/N (1)
SMB (1) OR (2) ✓
PLOTTED BY 3/5/81 DATE 3/5/81
QA STAMP 3/5/81

PLOT AND LABEL
T7 (SME TEMP)
T8 (-X-Z TEMP)
K (Design Scale Using K for
TFE "H" as Midscale, Plot
K factor using a scale of
0.000001 per minor Division)

BUMPER K FACTOR
LOCATIONS
(COUNTS) #

#0.4 μRAD
PER 1000
COUNT

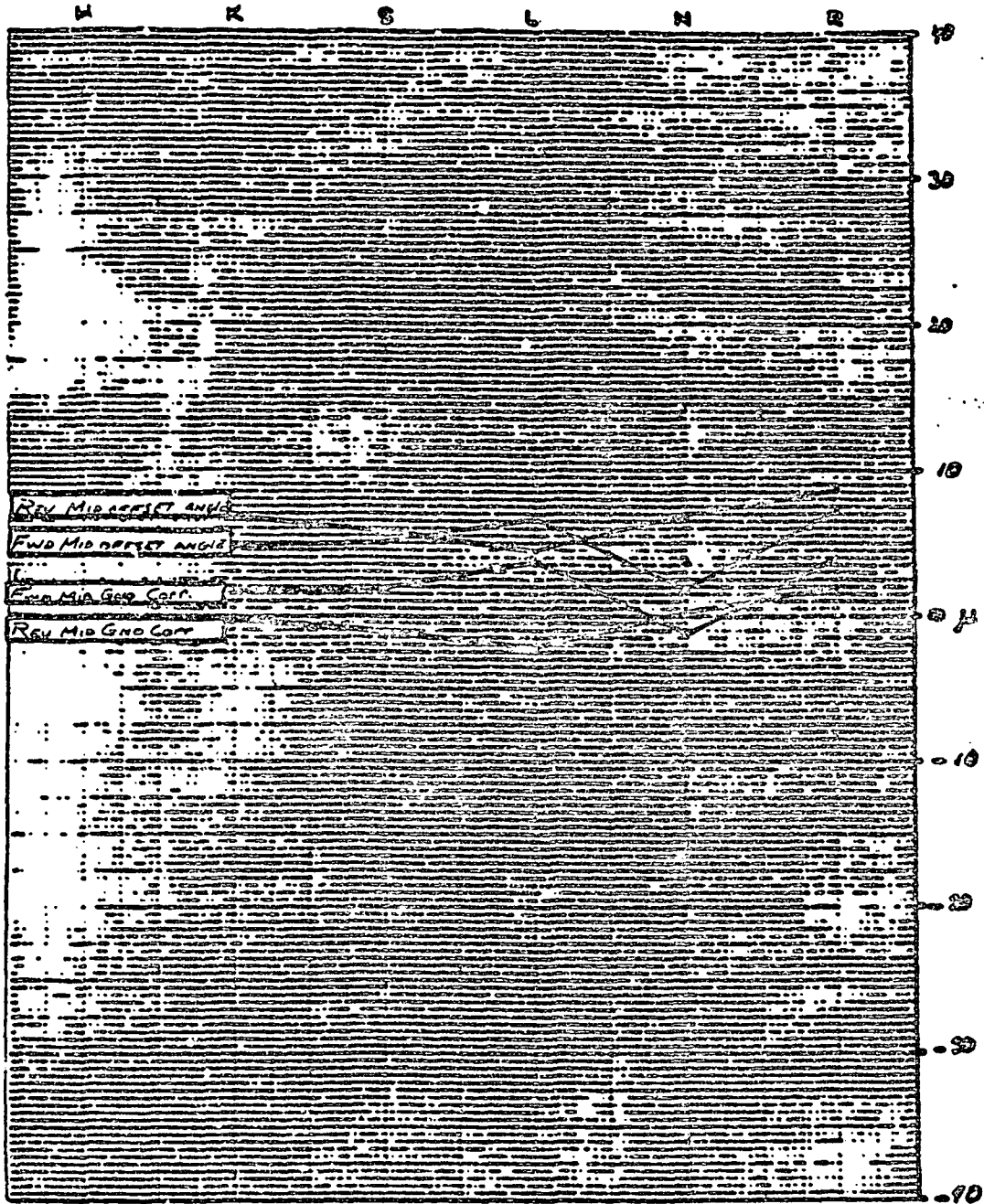
DATA SHEET 2.2-G

TS 32615-001
24.3

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DATA SUMMARY CHART MIDSCAN CORRECTION

TEST
FLOW
VENT



SMA DESIG. F.1
SMA S/N 4
SME(1) 08(2)
PLOTTED BY P DATE 3/8/81
QA STAMP

PLOT & LABEL
FWD } MIDSCAN
REV } OFFSET ANGLE
FWD } MIDSCAN
REV } GROUND CORR

100

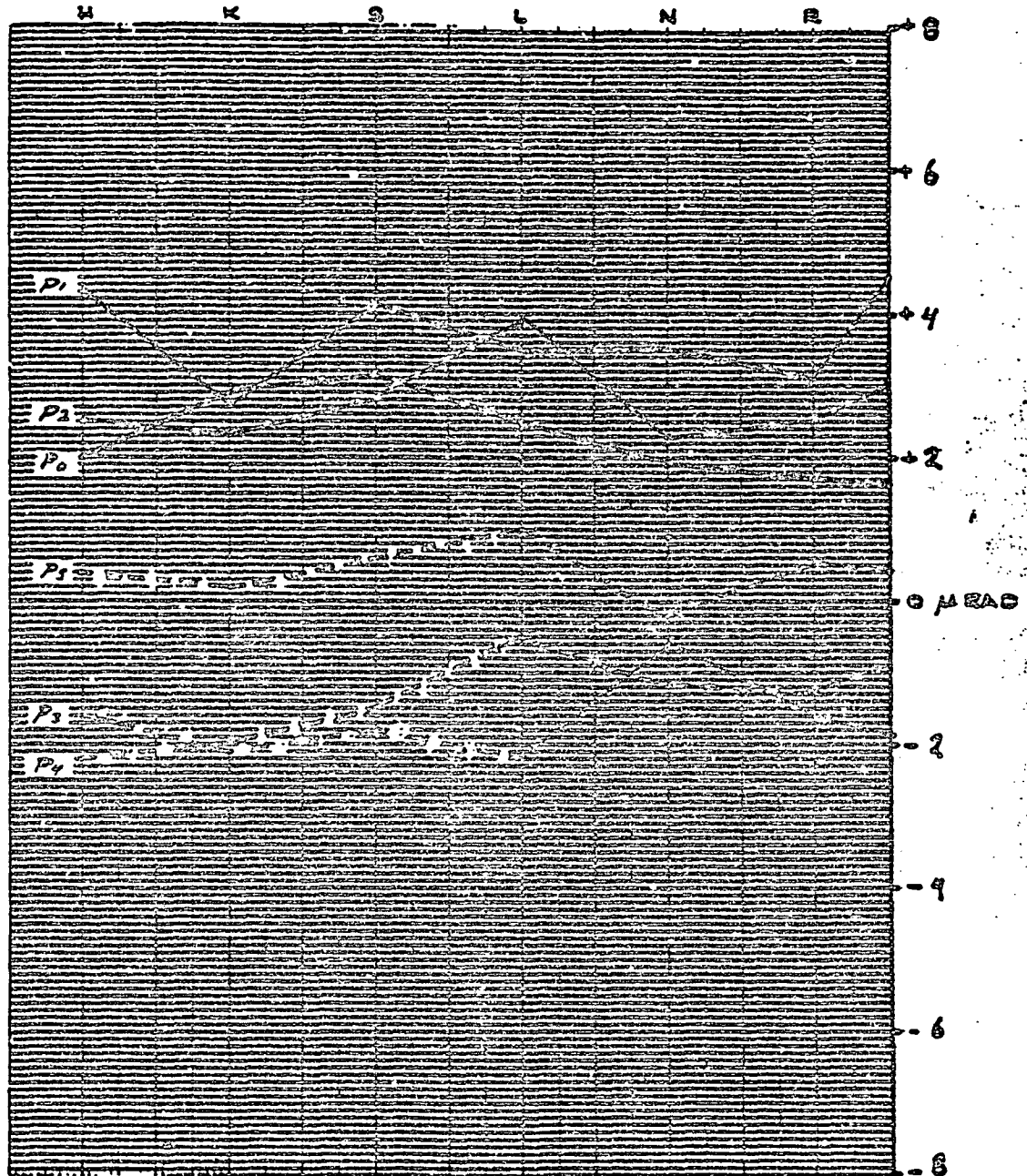
NO REQD-2

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DATA SHEET S.2-9
DATA SUMMARY CHART
SAM OFFSETS

TS 32015-007
3

TEST
FLOW
7/8 NT



SMA DESIG. F-1 PLOT & LABEL
SMA S/N 4 PO
SMA (1) OR (2) ✓ P1
PLOTTED BY F DATE 3/6/41 P2
QA STAMP P3
P4
P5

TS 32015-004
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DATA SHEET 9.2.1

TEST COMPUTER

PROGRAM LISTINGS

PROGRAM NAME: _____

SMA Designation F-1 S/N 9 operability check
 TAPE F-1 TRK 0 FILE 1-2-3 SHEET 1 OF 1

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01: * 3: "operability check: 1: tape AT-FM, trk 0, file 1, rev 121880" : wrt 6.3
02: 1: dlm C[15]: I[15]: Q[70]: Q[50]: T[10]
03: 2: dlm R[10]: S[17]: 191: C[2]: 71: D[3]: 41
04: 3: dlm T[3]: 51: U[20]: 91
05: 4: "LOW" -> D[1]: "NOM" -> D[2]: "HIGH" -> D[3]
06: 5: ent "SMA Designation(32 char max)": Q[1]: 321
07: 6: ent "Serial Number(3 char max)": Q[33]: 351
08: 7: ent "Test Flow Event(1 char max)": Q[36]: 421
09: 8: ent "Test Number(2 char max)": Q[43]: 441
10: 9: ent "Sequence Number": Q[3]
11: 10: ent "ent PRESSURE in TORR": Q[70]
12: 11: fnt 1: "SMA Designation": 3x, 32c: wrt 6.1, Q[1]: 321
13: 12: fnt 1: "Serial Number": 5x, 3c: wrt 6.1, Q[33]: 351
14: 13: fnt 1: "Test Flow Event": 3x, 1c: wrt 6.1, Q[36]: 361
15: 14: fnt 1: "Test Number": 7x, 2c: wrt 6.1, Q[43]: 441
16: 15: fnt 1: "Sequence Number": 4.0: wrt 6.1, Q[3]
17: 16: fnt 1: "pressure": 8x, e9.2: "TORR": wrt 6.1, Q[70]
18: 17: 1.0612875e7 -> Q[5]: 6.0743e-2 -> Q[6]
19: 18: 100 -> I[6]
20: 19: 0 -> I[8]: I[8] + 1 -> I[14]: 2 << (I[6] + 20) < (2I[14] + 30) + 5 + 16 -> T[6]: 2I[6] -> T[7]
21: 20: dlm S[1]: T[6]: W[1]: T[7]: buf "INIT", 5, 4: buf "SCAN", S, 4
22: 21: 777 -> 'dto' (I[6]) -> I[5]
23: 22: 0 -> I[10]: I[11]: 'dto' (I[10]) -> I[7]
24: 23: dsp "preset scan count to": I[5]: sto
25: 24: dsp "preset time count to 0": sto
26: 25: dsp "scan control switch to remote": sto
27: 26: dsp "turn on mirror": sto
28: 27: dsp "press INITIALIZE on DRS": sto
29: 28: 0 -> C: buf "INIT": tfr 8: "INIT": dsp "transferring data"
30: 29: rds("INIT") -> C: if C = -1: jmp 0
31: 30: dsp "turn off mirror": sto
32: 31: dsp "wait 30sec for mirror to settle": wait 30000
33: 32: dsp "dep CONT & SME ON simultaneously": sto
34: 33: "scan": buf "SCAN": i - 1 -> K: 2I[6] - 1 -> r1
35: 34: "1": red 717: r0: int(1e4frc(r0/1e6)) -> Q[2]
36: 35: 60 - 50: int(Q[2]/100) -> Q[2]: mod 100 -> r0: mod 100 -> r34
37: 36: "Delay": dsp "time delay": wait 8000: dsp "not transferring scan data"
38: 37: wto 8: i: wto 8: 0
39: 38: tfr 8: "SCAN": i: K + 2 -> K: dsp "transferring data"
40: 39: rds("SCAN") -> C: if C = -1: jmp 0
41: 40: fti (C) -> W[K]: if K < r1: jmp -2
42: 41: "2": red 717: r0: 100: int(r0/1e6) -> 81 -> Q[1]: int(1e4frc(r0/1e6)) -> Q[2]
43: 42: "2": red 717: r0: 100: int(r0/1e6) -> 81 -> Q[1]: 41: 00 -> r25

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43: dsp " "1-1+r40;'GETS$'+A;'GETS$'+A
44: 'MODE'+r42
45: -2 0;for I=2 to I[6]-9
46: for J=1 to I+9
47: if r42=1;eto "BUMPER"
48: "SAM":'LINE'(J,2.5,1.5)+r45;'LINE'(J,1,1.5)+r46
49: dsp "SCAN",J,"ASTERR",r45+r46
50: if r45=0 and r46=0;eto "SEARCH"
51: if 10*abs(r45+r46);eto "SEARCH"
52: eto "NEXTJ"
53: "BUMPER":'LINE'(J,1,3,1)+r45;dsp "SCAN",J,"B-B TIME",r45
54: if 10*abs(r45-71343);eto "SEARCH"
55: "NEXTJ":next J;I+NI;eto "CONT"
56: "SEARCH":J-I;next I
57: 'GETS$'+A;'GETS$'+B
58: 'dto'(shf(shf(B,-4),4))+I[5];'otd'(7777-I[5])+I[6]
59: dsp "turn-on time exceeded",I[6];"scans";wait 2000
60: dsp "Press RUN";end
61: "CONT":0+r36;for K=N to I[6];dsp "cal turn-on time at scan",K
62: if r48=0;71462-'LINE'(K,2.5,1.5)-'LINE'(K,1,1.5)-'TELE'(K,18,19)+r33
63: if r48=1;'LINE'(K,1,3,1)+r33
64: r36+r33+r36;next K;if r48=0;r36+71462+r36
65: if r48=1;r36+71343+r36
66: r35-1e-6;r36-r34+r37
67: *xd 2;1; r37/8;dsp "warning,turn-on time:",r37,"<8";sto
68: dsp "Scan Line Temperatures & Voltages"
69: "ENTER P-C-E-R CHARACTERISTICS FOR EACH SCANNER CHANNEL":
70: "0-3":1.31+Q[27];2.52+Q[28];3.52+Q[29];4.52+Q[30]
71: "4-7":5.11+Q[31];6.11+Q[32];7.11+Q[33];8.11+Q[34]
72: "8-11":9.11+Q[35];10.21+Q[36];11.11+Q[37];12.42+Q[38]
73: "12-15":13.31+Q[39];14.31+Q[40];15.42+Q[41];16.42+Q[42]
74: "16-19":17.31+Q[43];18.42+Q[44];19.42+Q[45];20.42+Q[46]
75: "Des C"+T[1];"Volts"+T[2];"mAmps"+T[3]
76: "QUARTER "+U[1];"EU=6.8I "+U[2];"EU=+27I "+U[3];"EU=-27I "+U[4]
77: "SMA -Z "+U[5];"SMA -X "+U[6];"SMA +Z "+U[7];"SMA +X "+U[8]
78: "TORO, BRDG "+U[9];"SME TEMP "+U[10];"SAM TEMP "+U[11]
79: "EU=6.8V "+U[12];"MF(-Z-X) "+U[13];"MF(+Z+X) "+U[14]
80: "SME(1)TEL "+U[15];"SME(2)TEL "+U[16];"SME PR U7 "+U[17]
81: "SAM1/BMP2 "+U[18];"EU=+27V "+U[19];"EU=-27V "+U[20]
82: fnt 1,/, "Temperatures and Voltages";wrt 6.1
83: fnt 1, "Ch",3x,"Scanner Out",5x,"Device",6x,"Cal",9x,"Measurement"
84: wrt 6.1;fnt 1,f5.0,3x,e11.4,5x,c9,f5.0,f16.3,1x,c5
85: fnt 2,f5.0,3x,e11.4,5x,c9,f5.0," ERROR";fnt 9,fz2.0;rem 722
86: for J=0 to 19
87: 10frc(100(J+27))+r1;if r1=1;wrt 722,"F4R7T1M3A1H1";jmp 2
88: wrt 722,"F1R7T1M3A1H1";if r1#2;dsp "Error: Sensor Type =",r1;end
89: wrt 709.9,J;if abs(J-1.5)<2;wait 15000
90: red 722,Q[J+7]
91: 9999.999+Q[J+47];int(10frc(Q[J+27]))+r2
92: if r2<1 or r2>5;dsp "Error: Calibration =",r2;end
93: int(Q[J+27])+r27;if r27<1 or r27>20;dsp "Error: Device =",r27;end
94: 1+r28;if Q[J+7]>1e6;-9999.999+Q[J+7];eto "Error"
95: if r2=2;eto "CUR2"
96: if r2=3;eto "SEN3"
97: if r2=4;2+r28;eto "VOLT4"
98: if r2=5;3+r28;eto "AMP5"
99: "CUR1":7167.9+r3;5700+r4;4564.7+r5;3680.1+r6;2985.8+r7;2437.2+r8;2001+r9
100: 1652.1+r10;1373+r11;1146+r12;901.5+r13;809.5+r14
101: -5+r15;0+r16;3+r17;10+r18;15+r19;20+r20;25+r21;30+r22
102: 35+r23;40+r24;45+r25;50+r26
103: if Q[J+7]>r3;eto "Error"
104: for K=4 to 14;if Q[J+7]<rK;jmp 2
105: (r(K+12)-r(K+11))/(Q[J+7]-r(K-1))/(r(K)-r(K-1))+r(K+11)+Q[J+47];eto "Print"
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106: next K:to "Error"
107: "CUR2":5778+r3:4530+r4:2850+r5:1839+r6:1218.5+r7:1000+r8:826.5+r9:573+r10
108: 464.8+r11:291.6+r12:213.8+r13:-15+r14
109: -10+r15:10+r16:10+r17:20+r18:25+r19:30+r20:40+r21:50+r22:60+r23:70+r24
110: if Q[J+7]-r3:to "Error"
111: for K=4 to 13:if Q[J+7]K:jmp 2
112: (rK-1)-(r(K+10))(Q[J+7]-r(K-1))/(rK-r(K-1))+r(K+10)+Q[J+47]:to "Print"
113: next K:to "Error"
114: "SEMP":Q[J+7]-12175/-127.896+Q[J+47]:to "Print"
115: "VOLT4":Q[J+7]+Q[J+47]:to "Print"
116: "AMP5":J=1:50Q[J+7]+Q[J+47]
117: if J=5 or J=1:2e4abs(Q[J+7])+Q[J+47]
118: "Print":wrt 5.1,J,Q[J+7],U[r27],r2,Q[J+47],T[r28]:jmp 2
119: "Error":wrt 6.2,J,Q[J+7],U[r27],r2
120: next J:wrt 6
121: ldf 2
122: "SUPERROUTINES":
123: "dto":ret 1e4dtoint(p1/8+4)+dto(p1mod8+4)
124: "otd":ret 815otdint(p1/1e5)+otd(p1mod1e5)
125: "GETS":r40+2+r40:ret cmptf(S[r40],r40+1)
126: "LINE":2:if(W[r2p1-1,2p1])-60+p7:if p1=1[6]:p7+2+p7
127: p=p10:for M=0 to p3-.5 by .5
128: p3+M-r5:if r5+p5
129: p5+2,p6mod2:-1-p12:8(p5mod1)+p13
130: itr(S[p7+p12-1,p7+p12])+p8:shf(shf(p8,-8),8)+p8
131: L=0 to 3:p9+2+(3-L)bit(L,p13,p8)+p9:next L
132: 16p10+p9p10:next M:p10+R:if p4=1:jmp 2
133: if 16+p3-.5)/2-1<p10:p10-16+(p3/.5)+p10
134: p10+p10/5.3064375+p11:ret p11
135: "MODE":p11 "TELE"(75,2):ret bit(5,R)
136: "TELE":2:if(W[r2p1-1,2p1])-34+p6:if p1=1[6]:p6+2+p6
137: 0+p9:for M=2 to 5:if pM=0:jmp 4
138: pM+2(pMmod2)-1+p11:if(S[p6+p11-1,p6+p11])+p7:shf(shf(p7,-8),8)+p7
139: 0+p8:for L=0 to 7:p8+2+(7-L)bit(L,p7)+p8:next L:p8+R
140: 255p8+p8+p9:next M
141: if 256+(M-2)/2-1<p9:p9-256+(M-2)+p9
142: p2+p1p9/5.3064375+p10+T:ret p10
1507

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fnt 3."operability check,2:tapeAT-FM,trl0,file2,rev121830"
1: dsp "press INITIALIZE on DAS":stp
2: 0+0:buf "INIT":dsp "press INITIALIZE on DAS":tfr 8,"INIT"
3: rds("INIT")+0:if C=-1:jmp 0
4: dsp C:"INIT words recieved":wait 2000
5: "Scan":buf "SCAN":1+K:2I[6]-1+r1:dsp "press SCAN on DAS"
6: tfr 8,"SCAN":K+2+K:dsp "transferring data"
7: rds("SCAN")+0:if C=-1:jmp 0
8: fti (C)-W[K]:if K<r1:jmp -2
9: 2I[14]+30+r2:5+C:0+r3+r6+r8
10: for I=1 to 1[6]:2I+K:if I=1[6]:r2-1+r2
11: C+r2+0:if(W[K-1,K])+r5
12: r5-r6+r7:C-r3+r4:dsp r7,r4:if r7=r4:jmp 3
13: r8+1+r8:dsp "bad SCAN data(incor wrd lng)":wait 2000
14: dsp "wrk lng=","r7,"should be","r4":stp
15: C-r3:r5-r6:next I:if r8>0:to "Scan"
16: -1+r40:"GETS":r:"GETS":r
17: if bit("xx10xxxx",A):dsp "RAW SAM":wait 3000
18: if bit("xx00xxxx",A):dsp "PROC SAM":wait 3000

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19: 'MODE'+r48:0+r33+r34+r38
20: for i=1 to I[6]:bit(7,'TELE'(1,2))+r49
21: r(33+r49)+(abs('TELE'(1,6,7))+r(33+r49))
22: if r43=1:to "BUMPER1"
23: "SAM1":'LINE'(1,2,5,1.5)+r45;'LINE'(1,1,1.5)+r46
24: 60743-r45-r46+r47:dsr "AST",r47,"ave scan",I;if abs(r47-60743)>10:sto
25: sto "CONT1"
26: "BUMPER1":'LINE'(1,1,3,1)+r47:dsr "B-B time",r47,"ave scan",I
27: if abs(r47-71242)>10:sto
28: "CONT1":r33+r47+r38:next I
29: I=I-N:int(N/2+.5)+r50:N-r50+r51
30: r33/r50+r33:r34/r51+r34:r38/N+r38
31: 0+r35+r36+r39
32: for i=1 to I[6]:bit(7,'TELE'(1,2))+r49:dsr "computing sigma of scan",I
33: r(35+r49)+(abs('TELE'(1,6,7))-r(33+r49))t2+r(35+r49)
34: if r48=1:to "BUMPER2"
35: "SAM2":'LINE'(1,2,5,1.5)+r45;'LINE'(1,1,1.5)+r46
36: 60743-r45-r46+r47:sto "CONT2"
37: "BUMPER2":'LINE'(1,1,3,1)+r47
38: "CONT2":r39+(r47-r38)t2+r39
39: next I:r(35/(r50-1))+r35:r(36/(r51-1))+r36:r(39/(N-1))+r39
40: 'MODE'+r48:bit(6,R)+r47
41: for i=1 to I[6]:for I=1 to 16:wrt 6.1,"-----"i:next I
42: wrt 1,"attach to data sheet 4.3.7-1",2x,z:wrt 6.1:wrt 6.3
43: wrt 1,"31x","OPERABILITY CHECK":wrt 6.1
44: wrt 1,"32x","AUTOMATIC CHECK":wrt 6.1
45: wrt 1,"SMA Designation:",c32,z:wrt 6.1,Q[1,32]
46: wrt 2," operation:",c6,z;if r47=0:wrt 6.2,"SME(1)"
47: if r47=1:wrt 6.2,"SME(2)"
48: wrt 3,c7;if r48=0:wrt 6.3,"SAM"
49: if r48=1:wrt 6.3,"BUMPER"
50: wrt 1,"Serial Number:",c3,24x,"Test Flow Event:",1c,"-",2c
51: wrt 6.1,Q[33,35],Q[36,36],Q[43,44]
52: wrt 1,"Run Number:",4x,f11.4,17x,"Sequence Number:",f1.0
53: wrt 6.1,Q[1]+Q[2]/1e4,Q[3]
54: wrt 1,"TEMPERATURES",8x,z:wrt 6.1
55: wrt 2,"T1 T2 T3 T4 T5 T6 T7 T8 T9"
56: wrt 6.2
57: wrt 1,13x,"(+Z) (-Z) (+X) (-X) (BRDG) (SAM) (SME) (-Z-X) (+Z+X)"
58: wrt 6.1
59: wrt 1,7x,"deg C",4x,9f7.1
60: wrt 6.1,Q[53],Q[51],Q[54],Q[52],Q[55],Q[57],Q[56],Q[59],Q[60]
61: wrt 1,"SMA POWER SUPPLIES",z:wrt 6.1
62: wrt 1,5x,"measured supply rne measured",6x,"spec",8x,"P/F"
63: wrt 6.1;2+r41;if Q[36,36]="L":1+r41
64: if Q[36,36]="N":3+r41
65: wrt 1,25x,c4,8x,"volts",7x,"mamps",6x,"mamps":wrt 6.1,D[1,r41]
66: wrt 1,14x,c4,f11.1,5x,c10,f10.1,7x,c4,9x,c1
67: wrt 6.1," +27",Q[65]," 28 to 30",Q[49]," 200",P/F(Q[49],0,200)
68: wrt 6.1," -27",Q[66]," -28 to -30",Q[50]," 200",P/F(Q[50],0,200)
69: wrt 6.1," -6.8",Q[58]," 6.3 to 7.7",Q[48]," 2500",P/F(Q[44],0,2500)
70: wrt 1,"SILEVEL DIGITAL",8x,"SME(1) ON",3x,"SME(2) ON",z
71: wrt 2," SAM(1)/BUMPER(2)":wrt 6.1:wrt 6.2
72: wrt 1,"TELEMETRY,volts ",2f12.1,f13.1:wrt 6.1,Q[61],Q[62],Q[64]
73: wrt 1,"MODE",19x,z;wrt 2,c13:wrt 6.1;if Q[62]>2.5:jmp 4
74: if Q[61]>2.5;if Q[64]>2.5:wrt 6.2,"SME(1),SAM" :jmp 5
75: if Q[61]>2.5:wrt 6.2,"SME(1),BUMPER":jmp 4
76: wrt 6.2,"OFF" :jmp 3
77: if Q[64]>2.5:wrt 6.2,"SME(2),BUMPER":jmp 2
78: wrt 6.2,"SME(2),SAM"
79: wrt 1,"PRESSURE,torr",f16.1,5x,"req'd <= 2",30x,c1
80: cll P/F(Q[70],0,2):wrt 6.1,Q[70],A$
81: wrt 1,"TOPONE PHU CFS,sec",7x,"mean",8x,"sigma",7x,"req'd":wrt 6.1
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0013: if r48=1; jmp 4
0014: fmt 1;c19,2f11.1,5x,"600 to 1000",17x,c1
0015: wrt 6.1,"(100 scans) TAU A ",r34,r36,'P/F'(r34,600,1000)
0016: wrt 6.1," TAU B ",r33,r35,'P/F'(r33,600,1000); jmp 4
0017: fmt 1;c19,2f11.1,9x,"----"
0018: wrt 6.1,"(100 scans) TAU A ",r34,r36
0019: wrt 6.1," TAU B ",r33,r35
0020: if r48=1; jmp 7
0021: fmt 1,/,,"ACTIVE SCAN TIME,usec combined",5x,"rea'd",ziwrt 6.1
0022: fmt 2,7x,"sigma",7x,"rea'd";wrt 6.2
0023: fmt 1,"(100 scans)",15x,"mean",7x,"60742.8";wrt 6.1
0024: fmt 1,f31.1,4x,"to 60743.2",f9.1,8x,"2.9",3x,c1,x,ziwrt 2,c1
0025: wrt 6.1,r38,r39,'P/F'(r38,60742.8,60743.2)
0026: wrt 6.1,'P/F'(r39,0,2.9); jmp 7
0027: fmt 1,/,,"BUMPER-BUMPER TIME,usec combined",5x,"rea'd",ziwrt 6.1
0028: fmt 2,8x,"sigma",7x,"rea'd";wrt 6.2
0029: fmt 1,"(100 scans)",15x,"mean",7x,"71342.2";wrt 6.1
0030: fmt 1,f31.1,4x,"to 71343.8",f9.1,8x,"2.9",8x,c1,x,ziwrt 2,c1
0031: wrt 6.1,r38,r39,'P/F'(r38,71342.2,71343.8)
0032: wrt 6.1,'P/F'(r39,0,2.9)
0033: fmt 1,/,,"TURN-ON TIME,sec",f13.1,5x,"spec <= 60",30x,c1
0034: wrt 6.1,r37,'P/F'(r37,0,60)
0035: fmt 1,"(time to reach within 10usec of active scan time)";wrt 6.1
0036: fmt 1,c5,ziwrt 1 to 16;wrt 6.1,"-----";next I
0037: fmt 1,2;wrt 6.1
0038: ldf 3
0039: "SUBROUTINES":
0040: "dto":ret 1e4dtoint(p1/8+4)+dto(p1mod8+4)
0041: "otd":ret 8+5otdint(p1/1e5)+otd(p1mod1e5)
0042: "GETS#":r40+2+r40;ret cmttf(S#[r40,r40+1])
0043: "LINE":2itf(N#[2p1-1,2p1])-60+p7;if p1=I[6];p7+2+p7
0044: 0+p10;for M=0 to p3-.5 by .5
0045: p2=M+p5;int(p5)+p6
0046: p6+2(p6mod2)-1+p12;8(p5mod1)+p13
0047: itf(S#[p7+p12-1,p7+p12])+p8;shf(shf(p8,-8),8)+p8
0048: 0+p9;for L=0 to 3;p9+2+(3-L)bit(L+p13,p8)+p9;next L
0049: 16p10+p9+p10;next M;p10+R;if p4=1; jmp 2
0050: if 16+(p3/.5)/2-1<p10;p10-16+(p3/.5)+p10
0051: p10+P;p10/5.3064375+p11;ret p11
0052: "MODE":c11 'TELE'(1,2);ret bit(5,R)
0053: "P/F": "P"→A$;if p1<p2 or p1>p3;"F"→A$
0054: ret A$[1]
0055: "TELE":2itf(N#[2p1-1,2p1])-34+p6;if p1=I[6];p6+2+p6
0056: 0+p9;for M=2 to 5;if pM=0; jmp 4
0057: pM+2(pMmod2)-1+p11;itf(S#[p6+p11-1,p6+p11])+p7;shf(shf(p7,-8),8)+p7
0058: 0+p8;for L=0 to 7;p8+2+(7-L)bit(L,p7)+p8;next L;p8+R
0059: 256p9+p8+p9;next M
0060: if 256+(M-2)/2-1<p9;p9-256+(M-2)+p9
0061: p9+P;p9/5.3064375+p10+T;ret p10
*21801

0062: "operability check,3;tapeAT-FM,trk0,file3,rev121880":fxd 0
0063: 1 SYNC "→B#[1];" 2 OPSTAT N "→B#[2]
0064: 3 SONLIN N "→B#[3];" 4 5 TRNERR N "→B#[4]
0065: 6 7 TORPLS N "→B#[5];" 8 9 SHSERR N-1"→B#[6]
0066: 10 11 FHSERR N-1"→B#[7];" 12 13 14 SUMERR N-1"→B#[8]
0067: 15 16 SONCTR "→B#[9];" 17 SONLIN N-1"→B#[10]
0068: 18 19 TRNERR N-1"→B#[11];" 20 21 TORPLS N-1"→B#[12]

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7: " 22 23 SHSERR N-2"→B$[13];" 24 25 FHSERR N-2"→B$[14]
8: "26 27 28 SUMERR N-2"→B$[15];"29 30 31 SCNTYM N-2"→B$[16]
9: " 32 NSCANS "→B$[17]
10: "Forward"→C$[1];"Reverse"→C$[2]
11: fmt 1,/, "Data Date: ",fz6.0,5x,"Data Time: ",fz4.0;wrt 6.1,Q[1],Q[2]
12: fmt 1,/, "SMA Designation: ",3x,32ciwrt 6.1,Q$[1,32]
13: fmt 1, "Serial Number: ",5x,3ciwrt 6.1,Q$[33,35]
14: fmt 1, "Run Number: ",7x,f11.4;wrt 6.1,Q[1]+Q[2]1e4
15: fmt 1, "Test Flow Event: ",3x,1ciwrt 6.1,Q$[36,36]
16: fmt 1, "Sequence Number: ",f4.0;wrt 6.1,Q[3]
17: 'MODE'→r48;if r48=0;fmt 1,/, "SAM MODE operation";wrt 6.1
18: if r48=1;fmt 1,/, "BUMPER MODE operation";wrt 6.1
19: for I=99 to 100
20: fmt 1,/, "scan N: ",f3.0,5x,"no. of words transferred = ",f5.0
21: if I=1;wrt 6.1,I;itf(W$[2I-1,2I]);jmp 2
22: wrt 6.1,I;itf(W$[2I-1,2I])-itf(W$[2I-3,2I-2])
23: fmt 1,/, "Line Length,N-1: ",7x,fz3.0,1x,fz3.0,1x,fz3.0,1x,fz3.0
24: for J=1 to 4;c11 'LINE'(I,J,1);R→r(40+J);next J
25: wrt 6.1,dto41,dto42,dto43,dto44
26: 'LINE'(I,2.5,1.5)→r45;'LINE'(I,1,1.5)→r46
27: if r48=0;60743-r45-r46→r47;fmt 1, "Active Scan Time,N-1: ",f10.2
28: if r48=1;'LINE'(I,1,3,1)→r47;fmt 1, "Bumper to Bumper Time,N-1: ",f12.1
29: wrt 6.1,r47
30: fmt 1, "Final Time,N: ",f18.2;wrt 6.1,1e6'TIMEF'(I)
31: fmt 1,/, "TELEMETRY";wrt 6.1
32: fmt 1,1x,"Byte No",3x,"Name",7x,"Contents",5x,"Pulses Time(usec)"
33: wrt 6.1
34: fmt 1,c19,2x,fz3.0,8x,f9.0,2f10.2
35: fmt 2,c19,2x,fz3.0,1x,fz3.0,4x,f9.0,2f10.2
36: fmt 3,c19,2x,fz3.0,1x,fz3.0,1x,fz3.0,f9.0,2f10.2
37: fmt 4,c19,2x,fz3.0,10x,"Bit 7 = ",f2.0," Scan N= ",c7
38: fmt 5,c19,2x,fz3.0,10x,"No.Scans = ",f5.0," (decimal)"
39: for J=1 to 32;c11 'TELE'(I,J);R→rJ;next J
40: wrt 6.1,B$[1],dto1
41: wrt 6.4,B$[2],dto2,bit(7,r2),C$(bit(7,r2)+1)
42: c11 'TELE'(I,3)
43: wrt 6.1,B$[3],dto3,P,T
44: c11 'TELE'(I,4,5)
45: wrt 6.2,B$[4],dto4,dto5,P,T
46: c11 'TELE'(I,6,7)
47: wrt 6.2,B$[5],dto6,dto7,P,T
48: c11 'TELE'(I,8,9)
49: wrt 6.2,B$[6],dto8,dto9,P,T
50: c11 'TELE'(I,10,11)
51: wrt 6.2,B$[7],dto10,dto11,P,T
52: c11 'TELE'(I,12,13,14)
53: wrt 6.3,B$[8],dto12,dto13,dto14,P,T
54: c11 'TELE'(I,15,16)
55: wrt 6.2,B$[9],dto15,dto16
56: c11 'TELE'(I,17)
57: wrt 6.1,B$[10],dto17,P,T
58: c11 'TELE'(I,18,19)
59: wrt 6.2,B$[11],dto18,dto19,P,T
60: c11 'TELE'(I,20,21)
61: wrt 6.2,B$[12],dto20,dto21,P,T
62: c11 'TELE'(I,22,23)
63: wrt 6.2,B$[13],dto22,dto23,P,T
64: c11 'TELE'(I,24,25)
65: wrt 6.2,B$[14],dto24,dto25,P,T
66: c11 'TELE'(I,26,27,28)
67: wrt 6.3,B$[15],dto26,dto27,dto28,P,T
68: c11 'TELE'(I,29,30,31)
69: wrt 6.3,B$[16],dto29,dto30,dto31,P,T
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70: 100 2.5:3f(17),d0r32,r32
    next 1
    use "finished":end
    "SUBROUTINES":
    "LINE":2:itf(W$[2p1-1,2p1])-50+p7;if p1=I[6];p7+2+p7
    0-p10;for M=0 to p3-.5 by .5
    p2+M+p5;int(p5)+p6
    p5+2(p5mod2)-1+p12;8(p5mod1)+p13
    1+(S$[p7+p12-1,p7+p12])+p8;shf(shf(p8,-8),8)+p8
    0-p9;for L=0 to 3;p9+2+(3-L)bit(L+p13,p8)+p9;next L
    16p10+p9-p10;next M;p10+R;if p4=1;jmp 2
    8: if 16(p3/.5)/2-1<p10;p10-16+(p3/.5)+p10
    p10+P;p10/5.3064375+p11;ret p11
    "MODE":call "TELE"(99,2);ret bit(5,R)
    84: "TELE":2:itf(W$[2p1-1,2p1])-34+p6;if p1=I[6];p6+2+p6
    0-p9;for M=2 to 5;if pM=0;jmp 4
    pM+2(pMmod2)-1+p11;itf(S$[p6+p11-1,p6+p11])+p7;shf(shf(p7,-8),8)+p7
    0-p8;for L=0 to 7;p8+2+(7-L)bit(L,p7)+p8;next L;p8+R
    256p9+p8-p9;next M
    1: 256(M-2)/2-1<p9;p9-256+(M-2)+p9
    p9-P;p9/5.3064375+p10+T;ret p10
    "TIMEF":2:itf(W$[2p1-1,2p1])+5)-61+p2;if p1=I[6];p2+2+p2
    cmpitf(S$[p2,p2+1])+p3;cmpitf(S$[p2+2,p2+3])+p4
    2:itf(p4+1)+shf(shf(p4,-15),15)+2+16shf(shf(p3,-12),12)+p5
    74: ret (p5-I[10])-(I[5]+I[11])
    4600
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TS 32015-004
 . 120-1

TEST COMPUTER

PROGRAM NAME:

SHA Designation F-1 S/N 4 DATA collector
TAPE F-1 TRK 0 FILE 4-5-6 SHEET 1 OF 1

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0: wrt 6:"Data collection,1;tapeAT-FM;trk0,file4,rev022781"
1: buf "INIT",5,4;buf "CAL",4,2;buf "DUMMY",3,2;fxd 0;rad
2: dim C[25],I[15],Q[70],Q#[50],T[10],Y[6]
3: 1.174162e7+Q[5]
4: dim B[3,4],Z[2],M[6];1.0612875e7+Q[5];6.0743e-2+Q[6]
5: dim T[3,5],U#[20,9]
6: fnt 1,1;"=====TEST INITIAL CONDITIONS=====";iurt 6.1
7: fnt 1,1;"(1) Fans must be off for at least 20 min.";iurt 6.1
8: fnt 1,1;"(2) Both Lasers must be on at least 45 min";iurt 6.1
9: fnt 1,1;"(3) DTS temp (+Z+X) must be +/-1 deg from (-Z-X)";iurt 6.1
10: fnt 1,1;"(4) Chamber pressure must be less than 2 torr";iurt 6.1
11: fnt 1,1;"(5) Cross axis polarity correct";iurt 6.1
12: fnt 1,1;"=====";iurt 6.1
13: dsp "Scanning Temperatures & Voltages"
14: "4,12,13":5.11+Q[31];13.31+Q[39];14.31+Q[40]
15: "Dec C"→T[1]
16: "SMA -Z" →U#[5];"MF(-Z-X)"→U#[13];"MF(+Z+X)"→U#[14]
17: fnt 1,1;"Temperatures and Voltages";iurt 6.1
18: fnt 1," Ch",3x,"Scanner Out",5x,"Device",6x,"Cal",9x,"Measurement"
19: wrt 6.1;fnt 1,f5.0,3x,e11.4,5x,c9,f5.0,f16.3,1x,c5
20: fnt 2,f5.0,3x,e11.4,5x,c9,f5.0," ERROR";fnt 9,fz2.0;rem 72
21: for I=1 to 3;13→J;if I<3;12→J;if I<2;4→J
22: wrt 722,"F4R7T1M3A1H1"
23: wrt 709.9,J;if abs(J-1.5)<2;wait 15000
24: red 722,Q[J+7]
25: 9999.999+Q[J+47];int(10frc(Q[J+27]))→r2
26: if r2<1 or r2>5;dsp "Error: Calibration =",r2;end
27: int(Q[J+27])→r27;if r27<1 or r27>20;dsp "Error: Device =",r27;end
28: 1→r28;if Q[J+7]>1e6;-9999.999+Q[J+7];sto "Error"
29: if r2=3;sto "SEN3"
30: "CUR1":7167.9+r3;5700+r4;4564.7+r5;3680.1+r6;2985.8+r7;2437.2+r8;2001
31: 1652.1+r10;1373+r11;1146+r12;901.5+r13;809.5+r14
32: -5+r15;0+r16;3+r17;10+r18;15+r19;20+r20;25+r21;30+r22
33: 35+r23;40+r24;45+r25;50+r26
34: if Q[J+7]>r3;sto "Error"
35: for K=4 to 14;if Q[J+7]<rK;jmp 2
36: (r(K+12)-r(K+11))(Q[J+7]-r(K-1))/(rK-r(K-1))+r(K+11)→Q[J+47];sto "Pri
37: next K;sto "Error"
38: "SEN3":(Q[J+7]-12175)/-127.096+Q[J+47];sto "Print"
39: "Print":wrt 6.1,J,Q[J+7],U#[r27],r2,Q[J+47],T[r28];jmp 2
40: "Error":wrt 6.2,J,Q[J+7],U#[r27],r2
41: next I;iurt 6
42: fnt 2,1,1;"Data Collection Complete";iurt 6.1

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4: sto 6:ent "ARE TEST CONDITIONS MET?(1/0) ",H;if H=1;sto +1
4: 2+12+Q[14];2+10+2+6+Q[15];300+Z[1];20+Z[2];0+r1+r4
45: "P0P5"+D#[1];"P1P4"+D#[2];"P2P3"+D#[3]
46: "Clock":red 717,r0;int(1e4frc(r0*1e-6))+Q[2];100int(r0*1e-6)+81+Q[1]
47: fmt 1,/, "Date: ",fz6.0,5x,"Time: ",fz4.0;wrt 6.1,Q[1],Q[2]
48: ent "SMA Designation? (32 char max)",Q#[1,32]
49: ent "Serial Number? (3 char max)",Q#[33,35]
50: ent "Test Flow Event? (1 char max)",Q#[36,42]
51: ent "Test Number? (2 char max)",Q#[43,44]
52: ent "Sequence Number?",Q[3]
53: fmt 1,/, "SMA Designation:",3x,32ciwrt 6.1,Q#[1,32]
54: fmt 1, "Serial Number:",5x,3ciwrt 6.1,Q#[33,35]
55: fmt 1, "Run Number:",7x,f11.4;wrt 6.1,Q[1]+Q[2]/1e4
56: fmt 1, "Test Flow Event:",3x,1ciwrt 6.1,Q#[36,42]
57: fmt 1, "Test Number:",7x,2ciwrt 6.1,Q#[43,44]
58: fmt 1, "Sequence Number:",f4.0;wrt 6.1,Q[3]
59: "SELECT MODE":
60: ent "Enter 1(Init),2(Cal),or 3(Scan)",r14
61: if r14=2;sto "CALIBRATE"
62: if r14=3;sto "SCAN"
63: "INITIALIZE":
64: dsp "SAM LOCK OFF, Start Mirror Scan";stp
65: dsp "press INITIALIZE on DAS";stp
66: 0+C;buf "INIT";dsp "not transferring data"
67: tfr 8,"INIT";dsp "Transferring Data"
68: rds("INIT")>C;if C=-1;jmp 0
69: dsp " ";fmt 1,/, "INITIALIZE",13x,"Words Transferred:",f4.0;wrt 6.1,C
70: fmt 1,/, "Word Number 0: INTERRUPT",10x,"(Raw ",fz6.0," Octal)"
71: cmprdb("INIT")>A+I[1]
72: wrt 6.1,dtoA;fmt 3,5x,"Bit",5x,"Description",5x,"Setting";wrt 6.3
73: fmt 2,5x,f2.0,c20,f4.0;wrt 6.2,0,"Panel Mode",bit(0,A)
74: wrt 6.2,1,"Calibrate Mode",bit(1,A)
75: wrt 6.2,2,"Scan Mode",bit(2,A)
76: cmprdb("INIT")>A+I[2]
77: fmt 1,/, "Word Number 1: PANEL STATUS",10x,"(Raw ",fz6.0," Octal)"
78: wrt 6.1,dtoA
79: wrt 6.3;wrt 6.2,0,"Bumper SW On",bit(0,A)
80: wrt 6.2,1,"Bea SAM P0/P3",bit(1,A)
81: wrt 6.2,2,"Bea SAM P2/P5",bit(2,A)
82: wrt 6.2,3,"Bea SAM PA/PB",bit(3,A)
83: wrt 6.2,45,"Processed SAM",bit("xx00xxxx",A)
84: wrt 6.2,45,"Raw SAM",bit("xx10xxxx",A)
85: wrt 6.2,45,"SAM 1 or SAM 2",bit("xx01xxxx",A)
86: wrt 6.2,45,"SAM 3 (CAL SAM)",bit("xx11xxxx",A)
87: wrt 6.2,6,"Single Reset",bit(6,A)
88: wrt 6.2,7,"End SAM P0/P3",bit(7,A)
89: wrt 6.2,8,"End SAM P2/P5",bit(8,A)
90: wrt 6.2,9,"End SAM PD/PE",bit(9,A)
91: wrt 6.2,10,"Ext Reset",bit(10,A)
92: wrt 6.2,11,"5 Facet",bit(11,A)
93: wrt 6.2,12,"Calibrate Mode",bit(12,A)
94: wrt 6.2,13,"Scan Mode",bit(13,A)
95: wrt 6.2,14,"Initialize Mode",bit(14,A)
96: wrt 6.2,15,"Slow Telemetry Mode",bit(15,A)
97: cmprdb("INIT")>A+I[3];cmprdb("INIT")>B+I[4]
98: fmt 1,/, "Word Numbers 2 and 3:",10x,"(Raw ",fz6.0,3x,fz6.0," Octal)"
99: wrt 6.1,dtoA,dtoB
100: shf(shf(B,-4),4)+r2;2+12-r2-1+I[6];Jtor2+I[5]
101: 100dtoashf(A,2)+dto(shf(B,12)+shf(shf(A,-14),10))+I[7]
102: 2+5shf(A,1)+2+4shf(shf(A,-15),15)+shf(B,12)+I[10]
103: (2+20-I[10])/Q[5]+I[12]
104: int(Q[5]/I[12]+.1)+I[8];I[8]I[12]+I[11]
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105: fmt 3.5x,"Scan Count Preset:      ",fz4.0," Octal",5x,"No. of Scans:",f9.1
106: wrt 6.3,I[5],I[6]
107: if I[8]>2000:dsp "Too many samples(max2000)";wait 5000;eto "INITIALIZE"
108: fmt 3.5x,"Time Count Preset:      ",fz7.0,11x,"No. of Samples:",f7.0
109: wrt 6.3,I[7],I[8];asb "CountCheck"
110: I[6]-I[13];if I[6]>3:I[6]+2+I[13]
111: I[8]+1+I[14];I[13]I[8]+I[9]
112: 2(I[13](2I[14]+30)+4)+18+T[6];2I[13]+T[7]
113: fmt 1.5x,"Number of Scans of S$ Dimension:",f5.0;wrt 6.1,I[13]
114: fmt 1.5x,"Scans x Samples:",f21.0;wrt 6.1,I[9]
115: fmt 1.5x,"Number of Samples plus 1:",f12.0;wrt 6.1,I[14]
116: fmt 1.5x,"Dimension of S$ Array:",f15.0;wrt 6.1,T[6]
117: fmt 1.5x,"Dimension of W$ Array:",f15.0,;wrt 6.1,T[7]
118: 1+r1;eto "SELECT MODE"
119: "CALIBRATE":
120: if r1=1;jmp 2
121: dsp "Initialize must precede Scan";wait 3000;eto "INITIALIZE"
122: ent "Select SAM/SME (1 or 2)",C[1]
123: if C[1]<1 or C[1]>2;jmp -1
124: *fmt 1.5x,"CALIBRATE:      SAM/SME:",f5.0;wrt 6.1,C[1]
125: 0+C[2]
126: "001":if val(Q$[33,35])#1;jmp 3
127: if C[1]=1;-6.7184e-2+C[2];0+C[3];6.7187e-2+C[4];jmp 2
128: if C[1]=2;-6.7176e-2+C[2];0+C[3];6.7179e-2+C[4]
129: "002":if val(Q$[33,35])#2;jmp 3
130: if C[1]=1;-6.7171e-2+C[2];0+C[3];6.7177e-2+C[4];jmp 2
131: if C[1]=2;-6.7176e-2+C[2];0+C[3];6.7177e-2+C[4]
132: "003":if val(Q$[33,35])#3;jmp 3
133: if C[1]=1;-6.7157e-2+C[2];0+C[3];6.7175e-2+C[4];jmp 2
134: if C[1]=2;-6.7171e-2+C[2];0+C[3];6.7195e-2+C[4]
135: "004":if val(Q$[33,35])#4;jmp 3
136: if C[1]=1;-6.71709e-2+C[2];0+C[3];6.71592e-2+C[4];jmp 2
137: if C[1]=2;-6.7182e-2+C[2];0+C[3];6.71597e-2+C[4]
138: "insert SAM angles":
139: if C[2]#0;jmp 3
140: dsp "Ernie's angles not found";wait 2000
141: dsp "see test procedure";end
142: fxd 6;dsp "- Ernie's angle used:",C[2];stp
143: dsp "+ Ernie's angle used:",C[4];stp
144: dsp "Check connection to SAM",C[1];stp
145: 0+C[6]+C[9]+C[10];163920+C[7];327840+C[8]
146: dsp "SAM LOCK On";stp
147: dsp "IFAR count reset on EXT";stp
148: buf "DUMMY";dsp "press INITIALIZE on DAS";tfr 8,"DUMMY"
149: 0+r22+r23
150: "Repeat":r23+r22;jmp 2
151: "Repeat2":jmp H
152: dsp "SAM Lock on P0P5";0+T;5+H;stp
153: fmt 1.5x,"-----P0P5-----";wrt 6.1
154: dsp "Check for Integrator 'IN'";stp
155: dsp "Zero both IFAR and DAS Counters";stp
156: 'CALTRANS'(1)+C[6];F+C[16];r17+M[1]
157: F+Y[1]
158: dsp "Bumper B (Integrator 'OUT')";0+T;stp
159: fmt 1.5x,"-----BUMPER B-----";wrt 6.1
160: 'CALTRANS'(2)+C[10];r17+M[5]
161: dsp "SAM Lock on P1P4";164000+T;13+H;stp
162: dsp "Check for Integrator 'IN'";stp
163: fmt 1.5x,"-----P1P2-----";wrt 6.1
164: 'CALTRANS'(1)+C[7];F+C[17];r17+M[2]
165: dsp "Bumper A (Integrator 'OUT')";328000+T;stp
166: fmt 1.5x,"-----BUMPER A-----";wrt 6.1
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178: dsp "SAM Lock on P2P3":328000+T:20+H:stp
179: dsp "Check for Inteator 'IN':istp
170: fnt 1.5x,"-----P2P3-----"iwr 6.1
171: 'CALTRANS'(1)+C[8]:F+C[18]:r17+M[3]
172: dsp "SAM Lock on P0P5":0+T:24+H:stp
173: dsp "Check for Inteator 'IN':istp
174: fnt 1.5x,"-----P0P5-----"iwr 6.1
175: 'CALTRANS'(1)+r3:F+r15:r17+M[6]
176: F+Y[2]
177: int(1e6frc(r21+1e-6))/100+Y[3]
178: M[6]-M[1]:r18:r3-C[6]:r20:r20/r18+r19
179: r15-C[16]:r40:r40/r18+r41+Y[6]
180: if r18<0 or abs(r20)>15:dsp "Repeat Calibration":wait 2000:sto "Repeat
181: "PrintCal":fnt 1.4,"Along Scan Calibration":iwr 6.1
182: fnt 1,"Time at end of Cal":f7.2:iwr 6.1,Y[3]
183: for I=1 to 5:r19(M[6]-M[1])+C[1+5]:C[1+5]:next I
184: for I=1 to 5:r41(M[6]-M[1])+C[1+15]:C[1+15]:next I
185: sin(C[2]):r5:sin(.5C[2]):t2+r6
186: C[6]-C[7]:r7:sin(C[4]):r8:sin(.5C[4]):t2+r9
187: C[8]-C[7]:r10:(r5r10-r7r8)/(r6r8-r5r9)+C[13]
188: (r7+C[13]r6)/r5+C[12]:C[7]:C[11]
189: fnt 1.4,2x,"Facet",8x,"IFAR Counts",10x,"Preset Angles",5x,"No,d,b"
190: wnt 5.1:fnt 1.3x,c4:4x,f9.2,3x,f6.2,4x,2e15.7
191: for I=1 to 3:iwr 6.1,D[C[1]:C[1+5]:C[1+15]:C[1+11]:C[1+10]:next I
192: (C[7]-C[5])/(C[8]-C[6])+C[5]:r23
193: fnt 1.4,4x,"K =",f10.6:iwr 6.1,C[5]
194: fnt 1.4,4x,"Bumper A:",f9.2:iwr 6.1,C[9]
195: fnt 1.4x,"Bumper B:",f9.2:/iwr 6.1,C[10]
196: fnt 1,"CROSS SCAN conversion factor:",f11.3,"urad/IFAR count"
197: (C[4]-C[2])/(C[8]-C[6])+C[23]:iwr 6.1,1e6C[23]
198: abs((Y[1]-Y[2])/r18)*1e6C[23]:Y[5]
199: fnt 1,"CROSS AXIS THERM DRIFT RATE:",f5.2,"urad/min":iwr 6.1,Y[5]
200: sto +2:if Y[5]>.8:sto +1
201: dsp "Repeat CAL/X-axis therm drift>.8":istp :sto "Repeat"
202: sto +2:if Q[36,36]="H":sto +1
203: fnt 1,"CROSS SCAN linear term removed:",f7.2,"urad",/iwp 2
204: fnt 1,"CROSS SCAN linear term desired:",f7.2,"urad",/
205: C[23](C[18]-C[16])+C[4]:iwr 6.1,1e6C[4]
206: dsp "check value of K":wait 3000
207: if I[C]#I[13]:sto "repeatability"
208: fnt 1,"Diff in K=",f10.6:/iwr 6.1,abs(r23-r22)
209: if .000005<abs(r23-r22):sto "Repeat"
210: sto "cont"
211: "repeatability":dsp "K within 1e-5 of K from TFE H?":wait 3000
212: dsp "record K on checkoff table":wait 3000
213: "cont":1+r4:sto "SELECT MODE"
214: "SCAN":
215: if r4>0:jmp 2
216: dsp "Calibrate must precede Scan":wait 3003:sto "CALIBRATE"
217: dsp "SAM LOCK Off: Start Mirror Scan":istp
218: dsp "insure vacuum less than 5 TORR":istp
219: dsp "insure vacuum pump is off":istp
220: dsp "insure table is floating":istp
221: trk 0:ldf 5
222: "SUBROUTINES":
223: "CALTRANS":buf "CAL":fnt 1.4,5x,"Along",5x,"Cross",4x,"A-Octal-B"
224: 0+Z+U+D+G:iwr 6.1:dsp "Transferring Data":0+r11:wait 5000
225: red 717:r21:60int(1e2frc(1e-6r21))+int(1e2frc(1e-4r21))+r17
226: r17+1e2frc(1e-2r21)/60+r17
227: "Loop":buf "CAL":fnt 1.2f10.2,2x,fz6.0,2x,fz5.0:tfz 8,"CAL"
228: rds("CAL")+C:if C=-1:jmp 0
229: cmprdb("CAL")+A:cmprdb("CAL")+B
230: if A<B:cmprdb("CAL")+A:cmprdb("CAL")+B
```

ORIGINAL PAGE IS
OF POOR QUALITY

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231: fnt 1: "Cross Data not 4XXX":/wrt 6.1
232: 0-C:buf "DUMMY":tfr 8,"DUMMY",1
233: rds:"DUMMY":C:if C=-1:jmp 0
234: 0-r11:sto "Loop"
235: cll "IFARAC":E+r12+E:F+r13+F
236: fxd 2:dsr r12,"/",r13,"/",r11:r11+1+r11
237: if Z[p1]=3:wrt 6.1,r12,r13,ctoA,ctoB
238: if r11=1:0-E-F
239: Z+1-Z:Z+S:if Z>1:(r12-T)+2-D+D:r13+2+G+G
240: if r11<Z[p1]+1:sto "Loop"
241: E-T*(S-1)*V:E/Z[p1]+E:F+W:F/Z[p1]+F:(((S-1)*D-V+2)/((S-1)*(S-2)))↑.5+r45
242: ((S-1)*G-W+2)/((S-1)*(S-2)))↑.5+r44
243: fnt 1:"Ave":f10.3,3x:f7.2,5x,"Minutes":f10.2:wrt 6.1,E,F,r17
244: fnt 1:"Sigma":f8.2,3x:f7.2,/wrt 6.1,r45,r44
245: if Z[p1]=20:jmp 4
246: sto +3:if r44>1.1:dsr "CROSS SIGMA >1.1: ARE FANS OFF":sto :sto +1
247: fnt 1:"RE-CALIBRATION OF PREVIOUS MIRROR POSITION":/wrt 6.1
248: sto "Repeat2"
249: ret E
250: "IFARAC":2↑16shf(A,12)+2shf(B,1)+shf(shf(B,-15),15)-C[14]+r12
251: shf(shf(A,-5),5)-C[15]+r13:ret
252: "CountCheck":if Q[36,36]="H":sto +2
253: sto "BADC":if I[5]=7730 and I[7]=3757165:sto "OKC"
254: sto "BADC":if I[5]=7774 and I[7]=3774665:sto "OKC"
255: "OKC":ret
256: "BADC":beep:dsr "RE-CHECK DAS COUNTER SETTINGS":sto "INITIALIZE":sto
*24455

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0: wrt 6:"data collection:2:tapeAT-FM, trk0, file5, rev22631"
1: dim S[16],W[16],P[2]:buf "SCAN",S#,4
2: "Init":dsr "press INITIALIZE on DAS":sto
3: 0-C:buf "INIT":tfr 8,"INIT"
4: rds("INIT"):C:if C=-1:jmp 0
5: dsr "allow 10 seconds warm up time":wait 10000
6: "Scan":buf "SCAN":1-K+C:2I[6]-1+r1:dsr "press SCAN on DAS"
7: tfr 8,"SCAN":K+2+K:dsr "Transferring Data"
8: rds("SCAN"):C:if C=-1:jmp 0
9: rti (C)+W[K]:if K=r1:jmp -2
10: red 717,r21:60int(1e2frc(1e-6r21))+int(1e2frc(1e-4r21))+r17
11: r17+1e2frc(1e-2r21)/60+r17
12: int(1e6frc(r21*1e-6))/100+Y[4]
13: Y[6]*Y[4]-Y[3]*1e6C[23]+r46
14: fnt 1: "Time at end of SCAN":f7.2,f8.2:wrt 6.1,Y[4],r17
15: fnt 1: "Time between Cal and Scan":f7.2,"min":wrt 6.1,Y[4]-Y[3]
16: fnt 1: "CROSS AXIS DRIFT:(last P0 to SCAN)":f5.2,"urad":wrt 6.1,r46
17: fnt 1: "CROSS AXIS REFERENCE OFFSET":f5.2,"urad":/
18: wrt 6.1,r46+Y[3]*1e6C[23]
19: sto +2:if Y[4]-Y[3]>2:dsr "TIME BETWEEN CAL & SCAN >2min":sto :sto +1
20: dsr "ldf 4--continue line 146":sto
21: dsr "1-1+r3:GETS'+A:GETS'+A
22: "MODE":r0
23: "IFARA"(1,1)+r1:"IFARA"(16,1)+r2
24: "IFARC"(1,1)+r4:"IFARC"(16,1)+r5
25: fxd 0:dsr "ALONG:P0=","r1," P0(last)=","r2:sto
26: if r1=r2+1 and r1=r2-1:jmp 2
27: beep:dsr "1st P0 MUST BE < +/-1 last P0":sto :sto "Init"
28: dsr "CROSS:P0=","r4," P0(last)=","r5:sto
29: if r4=r5+1 and r4=r5-1:jmp 2

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"Init

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1: beep;dsp "1st PO MUST be +/-1 last PO";istp;eto "Init"
2: "SAM":if abs(r1)>200 or abs(r2-r1)>5;eto "RESET"
3: if abs(r4)>50 or abs(r5-r4)>5;eto "RESET"
4: eto "CONT"
5: "BUMPER":if abs(r1)>2000 or abs(r2-r1)>5;eto "RESET"
6: if abs(r4)>500 or abs(r5-r4)>5;eto "RESET"
7: eto "CONT"
8: "RESET":dsp "SAM LOCK on & reset IFAR";istp
9: dsp "SAM LOCK off & start scan";istp
10: eto "Init"
11: "CONT":'GETS$'+A;'GETS$'+B
12: 2f5shf(A,1)+2f4shf(shf(A,-15),15)+shf(B,12)+r0;if r0=I[10];eto "TPokay"
13: fnt 1,/, "Time Count Preset Changed",/,wrt 6.1
14: r0+I[10];100dto shf(A,2)+dto(shf(B,12)+shf(shf(A,-14),10))+I[7]
15: (2f20-I[10])/Q[5]+I[12]
16: int(Q[6]/I[12]+.1)+I[3];I[3]I[12]+I[11];I[8]+1+I[14]
17: "TPokay":30+2(I[8]+1)+r1;0+r2;if I[6]=1;jmp 3
18: if itf(W$[1,2])#5+r1;1+r2
19: jmp 3
20: if itf(W$[1,2])#4+r1;1+r2
21: eto "Bad?"
22: if I[6]=2;jmp 3
23: for I=2 to I[6]-1;2I+r4;if itf(W$[r4-1,r4])-itf(W$[r4-3,r4-2])#r1;1+r2
24: next I
25: 2I[6]+r4;if itf(W$[r4-1,r4])-itf(W$[r4-3,r4-2])#r1-1;1+r2
26: "Bad?":1-r2=0;eto "Good"
27: fnt 1,"Unacceptable Word Count";wrt 6.1
28: fnt 1.5x,"Scan",5x,"Words",5x,"Should Be";wrt 6.1
29: fnt 1.4x,f4.0,6x,f4.0,6x,f4.0;if I[6]=1;wrt 6.1,1,W[1],r1+4;eto "Scan"
30: wrt 6.1,1,itf(W$[1,2]),r1+5;if I[6]=2;jmp 3
31: for I=2 to I[6]-1;2I+r4;if itf(W$[r4-1,r4])-itf(W$[r4-3,r4-2])>r5
32: wrt 6.1,1,r5,r1;next I
33: 2I[6]+r4;if itf(W$[r4-1,r4])-itf(W$[r4-3,r4-2])>r5
34: wrt 6.1,I[6],r5,r1-1;wrt 6.1;eto "Scan"
35: "Good":if I[13]=I[6];eto "CHK DATA"
36: 2I[6]+r4;fti (itf(W$[r4-1,r4])+r1)+W$[r4+1,r4+2]
37: fti (itf(W$[r4+1,r4+2])+r1)+W$[r4+3,r4+4]
38: for I=2itf(W$[r4-1,r4])+1 to 2itf(W$[r4+3,r4+4]) by 2
39: fti (-1)+S$[I,I+1];next I
40: "CHK DATA":1.05abs(C[8]-C[6])/I[8]+r1
41: for I=1 to I[6]-1
42: if 'IFARA'(I,I[14])# 'IFARAF'(I);eto "SAMPLE"
43: 1+Q[69];dsp "warning: last sample bad!";wait 1000
44: "SAMPLE":for J=1 to I[8];dsp "checking IFAR sample of scan",I+J/I[14]
45: if abs('IFARA'(I,J+1)-'IFARAF'(I,J))<r1;jmp 3
46: beep;dsp "bad IFARA sample!";istp
47: eto "Scan"
48: next J;next I
49: ent "enter PRESSURE in TORR",Q[70]
50: fnt 1,/, "Chamber Pressure (torr):",f5.2;wrt 6.1,Q[70]
51: ent "Data Tape Identifier(max 6 ch)",Q$[37,42]
52: ent "Track for Data(0 or 1)",T[1]
53: ent "File for Init/Cal Data",T[2]
54: T[2]+1+T[3];T[3]+1+T[4];if I[6]=I[13];T[4]+1+T[5]
55: trk 0;ldf 6
56: "SUBROUTINE":
57: "GETS$":r3+2+r3;ret cmpitf(S$[r3,r3+1])
58: "IFARA":10+4p2-3+p3;if p1#1;2itf(W$[2p1-3,2p1-2])+4p2-3+p3
59: cmpitf(S$[p3+2,p3+3])+p4;cmpitf(S$[p3,p3+1])+p5
60: ret 2f16shf(p5,12)+2shf(p4,1)+shf(shf(p4,-15),15)-C[14]
61: "IFARC":10+4p2-3+p3;if p1#1;2itf(W$[2p1-3,2p1-2])+4p2-3+p3
62: ret shf(shf(cmpitf(S$[p3,p3+1]),-5),5)-C[15]
63: "LINE":2itf(W$[2p1-1,2p1])-60+p7;if p1=I[6];p7+2+p7

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93: 0-p10;for M=0 to p3-.5 by .5
94: p1-M+p5;int(p5)+p6
95: p6+2*(p6mod2)-1+p12;8(p5mod1)+p13
96: p7-(8*(p7+p12-1,p7+p12))-p8;shf(shf(p8,-8),8)+p8
97: 0-p9;for L=0 to 3;p9+2*(3-L)bit(L+p13,p8)+p9;next L
98: 16p10+p9-p10;next M;p10+R;if p4=1;jmp 2
99: if 16*(p3-.5)/2-1<p10;p10-16*(p3-.5)+p10
100: p10+P;p10/5.3064375+p11;ret p11
101: "MODE":p11;"TELE"(1,2);ret bit(5,R)
102: "TELE":2;itf(W$(2p1-1,2p1))-34+p6;if p1=I[6];p6+2+p6
103: 0+p9;for M=2 to 5;if pM=0;jmp 4
104: pM+2*(pMmod2)-1+p11;itf(S$(p6+p11-1,p6+p11))+p7;shf(shf(p7,-8),8)+p7
105: 0+p8;for L=0 to 7;p8+2*(7-L)bit(L,p7)+p8;next L;p8+R
106: 256p3+p8+p9;next M
107: if 256*(M-3)/2-1<p9;p9-256*(M-2)+p9
108: p9+P;p9/5.3064375+p10+T;ret p10
109: "IFARAF":2;itf(W$(2p1-1,2p1))+3)-61+p2;if p1=I[6];p2+2+p2
110: cmpitf(S$(p2+2,p2+3))+p3;shf(shf(p3,-15),15)+2shf(p3,1)+p4
111: ret p4+2;16shf(cmpitf(S$(p2,p2+1)),12)-C[14]
*3921
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```
0: "data collection:3tapeAT-FM, trk0, file6, rev 22681":
1: dsp "Scanning Temperatures & Voltages"
2: "ENTER PROPER CHARACTERISTICS FOR EACH SCANNER CHANNEL":
3: "0-3":1.31+Q[27];2.52+Q[28];3.52+Q[29];4.52+Q[30]
4: "4-7":5.11+Q[31];6.11+Q[32];7.11+Q[33];8.11+Q[34]
5: "8-11":9.11+Q[35];10.21+Q[36];11.11+Q[37];12.42+Q[38]
6: "12-15":13.31+Q[39];14.31+Q[40];15.42+Q[41];16.42+Q[42]
7: "16-19":17.31+Q[43];18.42+Q[44];19.42+Q[45];20.42+Q[46]
8: "Deg C"→T$(1);"Volts"→T$(2);"mAmps"→T$(3)
9: "QUARTER"→U$(1);"EU=6.8I"→U$(2);"EU="+27I"→U$(3);"EU=-27I"→U$(4)
10: "SMA -Z"→U$(5);"SMA -X"→U$(6);"SMA +Z"→U$(7);"SMA +X"→U$(8)
11: "TORQ, BRDG"→U$(9);"SME TEMP"→U$(10);"SAM TEMP"→U$(11)
12: "EU=5.8V"→U$(12);"MF(-Z-X)"→U$(13);"MF(+Z+X)"→U$(14)
13: "SME(1)TEL"→U$(15);"SME(2)TEL"→U$(16);"SME PR U7"→U$(17)
14: "SAM1/BMP2"→U$(18);"EU="+27V"→U$(19);"EU=-27V"→U$(20)
15: fmt 1,/, "Temperatures and Voltages";wrt 6.1
16: fmt 1, " Ch", 3x, "Scanner Out", 5x, "Device", 6x, "Cal", 9x, "Measurement"
17: wrt 6.1;fmt 1,f5.0,3x,e11.4,5x,c9,f5.0,f16.3,1x,c5
18: fmt 2,f5.0,3x,e11.4,5x,c9,f5.0, " ERROR";fmt 9,fz2.0;rem 722
19: for J=0 to 19
20: 10frc(100(J+27))→r1;if r1=1;wrt 722,"F4R7T1M3A1H1";jmp 2
21: wrt 722,"F1R7T1M3A1H1";if r1#2;dsp "Error: Sensor Type =",r1;end
22: wrt 709.9,J;if abs(J-1.5)<2;wait 15000
23: red 722,Q[J+7]
24: 9999.999+Q[J+47];int(10frc(Q[J+27]))→r2
25: if r2<1 or r2>5;dsp "Error: Calibration =",r2;end
26: int(Q[J+27])→r27;if r27<1 or r27>20;dsp "Error: Device =",r27;end
27: 1-r28;if Q[J+7]1e6;-9999.999+Q[J+7];eto "Error"
28: if r2=2;eto "CUR2"
29: if r2=3;eto "SEN3"
30: if r2=4;2+r28;eto "VOLT4"
31: if r2=5;3+r28;eto "AMP5"
32: "CUR1":7167.9+r3;5700+r4;4564.7+r5;3680.1+r6;2985.8+r7;2437.2+r8;2001+r9
33: 1652.1+r10;1373+r11;1146+r12;901.5+r13;809.5+r14
34: -5+r15;0+r16;3+r17;10+r18;15+r19;20+r20;25+r21;30+r22
35: 35+r23;40+r24;45+r25;50+r26
36: 1-Q[J+7];eto "Error"
```



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37: for K=4 to 14:if Q[J+7]<R[K]:jmp 2
38: (R[K+12]-R[K+11])*(Q[J+7]-R[K-1])/(R[K]-R[K-1])+R[K+11]*Q[J+7]:sto "Print"
39: next K:sto "Error"
40: "CUR2":5776+R3:4530+R4:2850+R5:1839+R6:1218.5+R7:1000+R8:826.5+R9:573+R10
41: 404.8+R11:291.6+R12:213.8+R13:-15+R14
42: -10+R15:0+R16:10+R17:20+R18:25+R19:30+R20:40+R21:50+R22:60+R23:70+R24
43: if Q[J+7]>R3:sto "Error"
44: for K=4 to 13:if Q[J+7]<R[K]:jmp 2
45: (R[K+11]-R[K+10])*(Q[J+7]-R[K-1])/(R[K]-R[K-1])+R[K+10]*Q[J+7]:sto "Print"
46: next K:sto "Error"
47: "SEN3":(Q[J+7]-12175)/-127.096*Q[J+7]:sto "Print"
48: "VOLT4":Q[J+7]*Q[J+7]:sto "Print"
49: "AMP5":if J=1:1e5*Q[J+7]*Q[J+7]
50: if J=2 or J=3:2e4*abs(Q[J+7])*Q[J+7]
51: "Print":wrt 6.1,J,Q[J+7],U[R27],R2,Q[J+7],T[R28]:jmp 2
52: "Error":wrt 6.2,J,Q[J+7],U[R27],R2
53: next J:wrt 6
54: fmt 1,/, "Data Tape Identifier:",14x,6c:wrt 6.1,Q[37,42]
55: fmt 1, "Track for Data:",f21.0:wrt 6.1,T[1]
56: fmt 1, "Init/Cal Data File Number:",f10.0:wrt 6.1,T[2]
57: fmt 1, "Scan Data File Number:",f14.0:wrt 6.1,T[3]
58: fmt 1, "Norm/Avg Scan Data File Number:",f5.0:wrt 6.1,T[4]
59: if I[6]=I[13]:fmt 1, "Smoothing Coeffs File Number:",f7.0:wrt 6.1,T[5]
60: dsp "tear off & file printout in lab":sto
61: 0+R1
62: fmt 1,/, "=====":wrt 6.1
63: fmt 1, "IF 'ERROR' 48 OCCURS DURING MARKING OF TAPE: " :wrt 6.1
64: fmt 1, "type:sto REMARK---press execute---press continue " :wrt 6.1
65: fmt 1, "=====":wrt 6.1
66: "RECORD":R1+1+R1:if R1=1:dsp "Insert Data Tape",Q[37,42],"NOMINAL":sto
67: if R1=2:dsp "Insert Data Tape",Q[37,42],"RESERVE":sto
68: trk T[1]:fdf T[2]:tlist
69: dsp "files in printout will be erased":sto
70: trk T[1]:fdf T[2]:mk 1,1018:mk 2,T[6]+T[7]+16:if I[6]=I[13]:mk 1,400
71: dsp "Recording Files"
72: trk T[1]:rcf T[2],C[*],I[*],Q[*],Q$,T[*]
73: cll "CODES$(10001000)":rcf T[3],S$,W$
74: Q[1]+P[1]:Q[2]+P[2]
75: if I[6]=I[13]:rcf T[5],P[*]
76: if R1=1:sto "RECORD"
77: dsp "Data Collected: Finished":sto
78: "SUBROUTINE":
79: "CODES$":'btd'(P1)+P2:P(2)+P3:if P3>2+15-1:P3-2+16+P3
80: fti (P3)+S[1,1]:ret P2
81: "btd":P1+P2:0+P4:for L=0 to 7:P2mod10+P3:if P3>1:ret 1e-10
82: P4+P(3)+2+L+P4:int(P2/10)+P2:next L:ret P4
83: "GETS$":R3+2+R3:ret cmptf(S[R3,R3+1])
84: "REMARK":dsp "TRACK IS FULL-press continue":sto
85: fmt 1,/, "If track 0 is full use track 1":wrt 6.1
86: fmt 1, "If track 0 and 1 full mark new tape":wrt 6.1
87: fmt 1, "TO MARK A TRACK:":wrt 6.1
88: fmt 1, "(1) NEVER PRESS 'RUN' OR ALL DATA LOST":wrt 6.1
89: fmt 1, "(2) REWIND TAPE FOR DATA STORAGE":wrt 6.1
90: fmt 1, "(3) TYPE IN EMPTY TRACK NO.-EXECUTE":wrt 6.1
91: fmt 1, "(4) mk 1,20--EXECUTE":wrt 6.1
92: fmt 1, "(5) INSERT AT TAPE--sto'A'":wrt 6.1
93: dsp "SEE INSTRUCTIONS ABOVE":sto
94: "A":ent "Data Tape Identifier(max 6 char)",Q[37,42]
95: ent "Track for Data(0 or 1)",T[1]
96: ent "File for Init/Cal Data",T[2]
97: T[2]+1-T[3]:T[3]+1-T[4]:if I[6]=I[13]:T[4]+1-T[5]
98: fmt 1,/, "Data Tape Identifier:",14x,6c:wrt 6.1,Q[37,42]
99: fmt 1, "Track for Data:",f21.0:wrt 6.1,T[1]
```

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100: fmt 1: "Init/Cal Data File Number: ", f10.0; wrt 6.1, T[2]
101: fmt 1: "Scan Data File Number: ", f14.0; wrt 6.1, T[3]
102: fmt 1: "Norm/Ave Scan Data File Number: ", f5.0; wrt 6.1, T[4]
103: if I[6]=I[13]: fmt 1: "Smoothing Coeffs File Number: ", f7.0; wrt 6.1, T[5]
104: fmt 1: /; wrt 6.1; sto 70
#16639

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TS 52015-004
Rev B

DATA SHEET 9.2.1

TEST COMPUTER

PROGRAM LISTINGS

PROGRAM NAME: _____

SMA Designation F-1 S/M 4 NORM/AVG SCAN DATA
TAPE F-1 TRK 0-1 FILE 7-7 SHEET 1 OF 1

```

0: fnt 1: "NORM/AVG scan data:1:tapeAT-FM, trk0, file7, rev121880"
1: wrt 6.1:rad
2: dim D$(6,8): "CORR" + D$(1): "CORR/AVG" + D$(2): "NORM" + D$(3): "NORM/AVG" + D$
3: "RAW" + D$(5): "RAW/AVG" + D$(6)
4: dim C(25), I(15), Q(70), Q$(50), T(10)
5: dsp "Insert Data Tape" : sto
6: ent "Track for Data", r0
7: ent "File for INIT/CAL Data", r1
8: dsp "Loading INIT/CAL Data"
9: trk r0: ldr r1, C(*), I(*), Q(*), Q$, T(*)
10: dsp "Loading Scan Data"
11: dim S$(T(6)): W$(T(7)): buf "SCAN", S$, 4: ldr T(3), S$, W$
12: fnt 1: "Data: ", f25.0, 5x, "Time: ", f24.0: wrt 6.1, Q(1), Q(2)
13: fnt 1: "SMA Designation: ", 3x, 32: wrt 6.1, Q$(1, 32)
14: fnt 1: "Serial Number: ", 5x, 3: wrt 6.1, Q$(33, 35)
15: fnt 1: "Run Number: ", 7x, f11.4: wrt 6.1, Q(1) + Q(2) / 1e4
16: fnt 1: "Test Flow Event: ", 3x, 1: wrt 6.1, Q$(36, 36)
17: fnt 1: "Test Number: ", 7x, 2: wrt 6.1, Q$(43, 44)
18: fnt 1: "Sequence Number: ", f4.0: wrt 6.1, Q(3)
19: fnt 1: "data tape identifier: ", 14x, 6: wrt 6.1, Q$(37, 42)
20: fnt 1: "track for data: ", f21.0: wrt 6.1, T(1)
21: fnt 1: "INIT/CAL data file number: ", f10.0: wrt 6.1, T(2)
22: fnt 1: "SCAN data file number: ", f14.0: wrt 6.1, T(3)
23: fnt 1: "NORM/AVG SCAN data file number: ", f5.0: wrt 6.1, T(4)
24: fnt 1: "Smoothing Coeffs file number: ", f7.0, /: wrt 6.1, T(5)
25: if I(6) = I(13): 110 + r0
26: if I(6) # I(13): 111 + r0
27: sto 30
28: dsp "ent mode(1=yes, 0=no)": wait 2000
29: 111 + r0: ent "ent mode [RAW/CORR/NORM/AVG]", r0: if r0 < 100 or r0 > 100: 1:
30: cll "CODES$": (1e4 + r0 + r0): "btd" (r0) + r0
31: fnt 1: "mode selected: ", c8: wrt 6.1, D$(r0 - 3): wrt 6
32: "GO TO PART2":
33: dsp "insert AT tape" : sto
34: trk 1: ldr 7
35: "SUBROUTINES":
36: "btd": p1 - p2: 0 - p4: for L = 0 to 7: p2 mod 10 + p3: if p3 > 1: ret 1e - 10
37: p4 + p(3) 2: L - p4: int(p2 / 10) + p2: next L: ret p4
38: "CODES$": "btd" (p1) + p2: p(2) 2: 8 + p3: if p3 > 2: 15 - 1: p3 - 2: 16 + p3
39: fti (p3) - S$(1, 1): ret p2
40: p = 0

```

```
0: fnt 1:,"NORM/AVG scan data,2:tapeAT-FM, trk1, file7, rev121880"
1: if bit(8, itf(S$[1,2]))=1 and bit(8, itf(S$[1,2]))=1;eto "AVERAGE"
2: "PROFILE CORRECTION":bit(9, itf(S$[1,2]))+r0
3: .5+rlent "ent midscan press corr coeff",r1;cll 'STOP'(r1)
4: 'PRESS':Q[70]/1e6C[33]+A
5: fnt 1:"midscan pressure correction.=",f7.2," IFAR count":iwr 6.1,A
6: for I=1 to I[6]-1:(-1)^(Imod2+1)A+r2
7: 'IFARA'(I,1)+r3;'IFARC'(I,1)+r19;'IFARAF'(I)+r4
8: 'TIMEF'(I)+r7
9: (r4-r3)/r7+r8;-4r2/r7+2+r9;r7/Q[6]+r10
10: if abs(r7-Q[6])<3e-6;jmp 4
11: fnt 1:,"Warning: FINAL T:   =",f9.2," sec, out of spec"
12: wrt 6.1,1e6r7
13: dsp "Warning: large Final Time error":stp
14: fnd 2:for J=0 to I[14]+1;if r0=0:dsp "pressure correcting scan",I+J/I[8]
15: if r0=1:dsp "CORR/NORM scan",I+J/I[8]
16: if J=I[14]:'IFARA'(I,J+1)+r11;'IFARC'(I,J+1)+r20+r21;J[I[12]+r12;jmp 3
17: if J=I[14]:'IFARAF'(I)+r11;'IFARCM'(I)+r20+r21;'TIMEM'(I)+r12;jmp 2
18: if J=I[14]+1:'IFARAF'(I)+r11;r7+r12
19: r11-r0+12-r3+r13;r9+r12(r12-r7)+r14;r13-r14+r15;r8+r12+r3+r15+r16+r17
20: "NORM":if r0=1;r10(r16-r3)+r3+r17;r10(r20-r19)+r19+r21
21: rndr(r17,0)+r18;rndr(r21,0)+r21
22: if J=I[14]:'STOIA'(I,J+1,r18);cll 'STOIC'(I,J+1,r21)
23: if J=I[14]:'STOIAM'(I,r18);cll 'STOICM'(I,r21)
24: if J=I[14]+1 and r0=1;cll 'STOTF'(I,Q[6])
25: next J
26: next I
27: if bit(8, itf(S$[1,2]))=0;eto "RECORD"
28: "AVERAGE":
29: 2I[6]+r1;2I[14]+30+r2
30: fti (itf(W$[r1-1,r1])+r2)+W$[r1+1,r1+2]
31: fti (itf(W$[r1+1,r1+2])+r2)+W$[r1+3,r1+4]
32: for I=itf(W$[r1-1,r1])+1 to itf(W$[r1+3,r1+4])
33: fti (-1)+S$[2I-1,2I];next I
34: for J=1 to I[14]+1;dsp "averaging sample",J
35: for K=1 to 2
36: 0+r3+r4+r5+r6
37: for I=K to I[6]-1 by 2
38: if J=I[14]:'IFARC'(I,J)+r1;'IFARA'(I,J)+r2
39: if I[14]+1=J:'IFARCF'(I)+r1;'IFARAF'(I)+r2;'TIMEF'(I)+r3
40: r4+r1+r4;r5+r2+r5;r6+r3+r6
41: next I
42: I-2+I:(I+Imod2)/2+r7
43: r4/r7+r4;r5/r7+r5;r6/r7+r6
44: if J=I[14]:'STOIC'(I[6]+K,J,r4);cll 'STOIA'(I[6]+K,J,r5)
45: if I[14]+1=J:'STOICF'(I[6]+K,r4);cll 'STOIAF'(I[6]+K,r5)
46: if I[14]+1=J:'STOTF'(I[6]+K,r6)
47: next K
48: next J
49: "RECORD":0+r1
50: "record":r1+1+r1;if r1=1;dsp "Insert Data Tape",Q$[37,42],"NOMINAL":stp
51: if r1=2;dsp "Insert Data Tape",Q$[37,42],"RESERVE":stp
52: dsp "recording NORM data"
53: trk T[1];rcr T[4],S$,W$
54: if r1=1;eto "record"
55: dsp "finished":end
56: "SUBROUTINES":
57: "IFARA":10+4p2-3+p3;if p1#1;2itf(W$[2p1-3,2p1-2])+4p2-3+p3
58: cmpitf(S$[p3+3,p3+3])+p4;cmpitf(S$[p3,p3+1])+p5
59: ret 2:15shf(p5,12)+2shf(p4,1)+shf(shf(p4,-15),15)-Q[14]
60: "IFARAF":2+itf(W$[2p1-1,2p1])+3)-61+p2;if p1=I[6];p2+2+p2
61: cmpitf(S$[p3+3,p3+3])+p3;shf(shf(p3,-15),15)+2shf(p3,1)+p4
62: ret 2:15shf(p5,12)+2shf(p4,1)+shf(shf(p4,-15),15)-Q[14]
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63: "IFARAM":2(itf(W#[2p1-1,2p1])+7)-61+p2;if p1=I[6];p2+2+p2
64: cmpitf(S#[p2+2,p2+3])+p3;shf(shf(p3,-15),15)+2shf(p3,1)+p4
65: ret p4+2;16shf(cmpitf(S#[p2,p2+1]),12)-C[14]
66: "IFARA":10+4p2-3+p3;if p1#1;2itf(W#[2p1-3,2p1-2])+4p2-3+p3
67: ret shf(shf(cmpitf(S#[p3,p3+1]),-5),5)-C[15]
68: "IFARCF":2(itf(W#[2p1-1,2p1])+3)-61+p2;if p1=I[6];p2+2+p2
69: ret shf(shf(cmpitf(S#[p2,p2+1]),-5),5)-C[15]
70: "IFAROM":2(itf(W#[2p1-1,2p1])+7)-61+p2;if p1=I[6];p2+2+p2
71: ret shf(shf(cmpitf(S#[p2,p2+1]),-5),5)-C[15]
72: "PRESS":ret itf(S#[9,10])/100
73: "STOIA":10+4p2-3+p4;if p1#1;2itf(W#[2p1-3,2p1-2])+4p2-3+p4
74: "stoid":p3+C[14]+p7
75: shf(shf(cmpitf(S#[p4,p4+1]),-4),4)+2+12int(p7/2+16)+p5
76: cll 'STORE'(p5,p4);2+16frc(p7/2+16)+p6;cll 'STORE'(p6,p4+2);ret
77: "STOIAF":2(itf(W#[2p1-1,2p1])+3)-61+p3;if p1=I[6];p3+2+p3
78: cll 'stoid'(0,0,p2,p3);ret
79: "STOIAM":2(itf(W#[2p1-1,2p1])+7)-61+p3;if p1=I[6];p3+2+p3
80: cll 'stoid'(0,0,p2,p3);ret
81: "STOIC":10+4p2-3+p4;if p1#1;2itf(W#[2p1-3,2p1-2])+4p2-3+p4
82: "stoid":p3+C[15]+shf(shf(cmpitf(S#[p4,p4+1]),11),-11)+p5
83: cll 'STORE'(p5,p4);ret
84: "STOICF":2(itf(W#[2p1-1,2p1])+3)-61+p3;if p1=I[6];p3+2+p3
85: cll 'stoid'(0,0,p2,p3);ret
86: "STOICM":2(itf(W#[2p1-1,2p1])+7)-61+p3;if p1=I[6];p3+2+p3
87: cll 'stoid'(0,0,p2,p3);ret
88: "STOF":1+100p1)+S#[9,10];ret
89: "STORE":if p1>2+15-1;p1-2+16+p1
90: fcl (cmpitf)+S#[p2,p2+1];ret
91: "STOTF":2(itf(W#[2p1-1,2p1])+5)-61+p3;if p1=I[6];p3+2+p3
92: p3-I[11]/Q[5]+I[10]+p4;p4/2+16+p5
93: cll 'STORE'(int(p5),p3);cll 'STORE'(2+16frc(p5),p3+2);ret
94: "TIMEF":2(itf(W#[2p1-1,2p1])+5)-61+p2;if p1=I[6];p2+2+p2
95: cmpitf(S#[p2,p2+1])+p3;cmpitf(S#[p2+2,p2+3])+p4
96: 2shf(p4,1)+shf(shf(p4,-15),15)+2+16shf(shf(p3,-12),12)+p5
97: ret (p5-I[10])/Q[5]+I[11]
98: "TIMEM":2(itf(W#[2p1-1,2p1])+9)-61+p2;if p1=I[6];p2+2+p2
99: cmpitf(S#[p2,p2+1])+p3;cmpitf(S#[p2+2,p2+3])+p4
100: 2+5shf(p3,1)+2+4shf(shf(p3,-15),15)+shf(p4,12)+p5
101: "IFARAM"(p1)+p6;for M=int(I[8]/2.1) to I[8];"IFARA"(p1,M)+p7
102: if abs(p6-p7)>abs("IFARA"(p1,M+1)-p7);next M
103: ret (p5-I[10])/Q[5]+(M-1)I[12]
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TS 32015-004
Rev 3

DATA SHEET 5.2.1

TEST COMPUTER

PROGRAM LISTINGS

PROGRAM NAME: _____

SMA Designation F-1 S/N 4 Along Scan Profile
TAPE F-1 TRK 0 FILE R-9-10 SHEET 1 OF

```
0: fnt 1;"along scan profile,1;tapeAT-FM,trlk0,file8,rev121880"
1: wrt 6.1
2: dim D$(5,3);"CORR"+D$(1,1);"CORR/AVG"+D$(2,1);"NORM"+D$(3,1);"NORM/AVG"+I
3: "RAW"+D$(5,1);"RAW/AVG"+D$(6,1)
4: dim Q(25),I(15),Q(70),Q$(50),T(10)
5: fnd 0;rod
6: dsp "Insert Data Tape";stp
7: ent "Track for Data?";r0
8: ent "File for Init/Cal Data?";r1
9: dsp "Loading Init/Cal Data"
10: trk r0;ldf r1,Q(*),I(*),Q(*),Q$,T(*)
11: ent "Print all data? (1=y,0=n)";P
12: fnt 1,/, "Data Date: ",fz6.0,5x, "Data Time: ",fz4.0;wrt 6.1,Q(1),Q(
13: fnt 1,/, "SMA Designation: ",3x,32ciwrt 6.1,Q$(1,32)
14: fnt 1, "Serial Number: ",5x,3ciwrt 6.1,Q$(33,35)
15: fnt 1, "Run Number: ",7x,f11.4;wrt 6.1,Q(1)+Q(2)/1e4
16: fnt 1, "Test Flow Event: ",3x,1ciwrt 6.1,Q$(36,36)
17: fnt 1, "Test Number: ",7x,2ciwrt 6.1,Q$(43,44)
18: fnt 1, "Sequence Number: ",f4.0;wrt 6.1,Q(3)
19: fnt 1,/, "Data Tape Identifier: ",14x,6ciwrt 6.1,Q$(37,42)
20: fnt 1, "Track for Data: ",f21.0;wrt 6.1,T(1)
21: fnt 1, "Init/Cal Data File Number: ",f10.0;wrt 6.1,T(2)
22: fnt 1, "Scan Data File Number: ",f14.0;wrt 6.1,T(3)
23: fnt 1, "Norm/Avg Scan Data File Number: ",f5.0;wrt 6.1,T(4)
24: fnt 1, "Smoothing Coeffs File Number: ",f7.0,/,wrt 6.1,T(5)
25: dsp "Loading Smooth Coeffs"
26: dim P(50);ldf T(5),P(*)
27: 4+r1;sto 30
28: dsp "Data for Smoothed Profile";wait 2000
29: ent "3=RAW,4=CORR";r1;if r1<3 or r1>4;jmp 0
30: dim S$(T(6)),W$(T(7));buf "SCAN",S$,4
31: dsp "loading SCAN data: file",T(1);ldf T(1),S$,Ws
32: shf(itf(S$(1,2)),8)mod16+r0
33: dsp "only",D$(r0-3), "is available";stp
34: if r0mod2=0;r0+P(45);jmp 3
35: dsp "select",r0-1,"=",D$(r0-4),";",r0,"=",D$(r0-3);stp
36: ent "ent selection",P(45)
37: for I=1 to I(5);if 'IFARR'(I,I(14))='IFARRA'(I);1+Q(69)
38: next I
39: "SMOOTH NONLINEARITIES":
40: " ";
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43: for L=1 to 2:cll 'SMOOTH'
44: for I=1 to E:MC[I,F]+PC[I+10(L-1)+3]:next I:next L
45: tnt 1:"SMOOTHED PROFILES ALONG SCAN":wrt 6.1
46: tnt 1:"Order of T",10x:"Fwd",12x:"Rev":wrt 6.1:fnt 1,f6.0,7x,2e15.7
47: for I=0 to D:wrt 6.1:I,PC[I+4],PC[I+14]:next I
48: tnt 1:"warning: data used to generate coeffs: ",c8:wrt 6.1,D5[PC[45]-3]
49: "GO TO PART 2":
50: dsp "Insert Tape AT":sto
51: trk 0:if 'MODE'=0:ldf 9
52: if 'MODE'=1:ldf 10
53: "SUBROUTINES":
54: "ANGA":ash((2(p1-C[11])+C[13])/C(4C[12]+2+C[13]+2))+p2
55: ret p2-atn(.5C[13]/C[12])
56: "IFARRA":10+4p2-3+p3:if p1#1:2itf(W5[2p1-3,2p1-2])+4p2-3+p3
57: cmptf(S5[p3+2,p3+3])+p4:cmptf(S5[p3,p3+1])+p5
58: ret 2+16shf(p5,12)+2shf(p4,1)+shf(shf(p4,-15),15)-C[14]
59: "IFARRAF":2(itf(W5[2p1-1,2p1]+3)-61+p2):if p1=I[6]:p2+2+p2
60: cmptf(S5[p2+2,p2+3])+p3:shf(shf(p3,-15),15)+2shf(p3,1)+p4
61: ret p4+2+16shf(cmptf(S5[p2,p2+1]),12)-C[14]
62: "MODE":cll 'TELE':(1,2):ret bit(5,R)
63: "TELE":2itf(W5[2p1-1,2p1])-34+p6:if p1=I[6]:p6+2+p6
64: 0-p9:or M=2 to 5:if pM=0:jump 4
65: p7+2+8mod2-1+p11:itf(S5[p6+p11-1,p6+p11])+p7:shf(shf(p7,-8),8)+p7
66: 0-p9:for L=0 to 7:p8+2+(7-L)bit(L,p7)+p8:next L:p8+R
67: 256p9+p8-p9:next M
68: if 256(M-2)+2-1(p9:p9-256(M-2))+p9
69: p9+P:p9+5.3064375+p10+T:ret p10
70: "TIMEF":2(itf(W5[2p1-1,2p1]+5)-61+p2):if p1=I[6]:p2+2+p2
71: cmptf(S5[p2,p2+1])+p3:cmptf(S5[p2+2,p2+3])+p4
72: 2shf(p4,1)+shf(shf(p4,-15),15)+2+16shf(shf(p3,-12),12)+p5
73: ret (p5-I[10])/Q[5]+I[11]
74: "SMOOTH":L+p1:if PC[45]mod2=1:I[6]+L+p1
75: 'ANGA'('IFARRA'(p1,1))+p3:('ANGA'('IFARRAF'(p1))-p3)/'TIMEF'(p1)+p4
76: for I=1 to E:for J=1 to F:0+MC[I,J]:next J:next I
77: for K=1 to I[14]+1
78: if K=I[14] and Q[69]=1:sto "SkipSample"
79: dsp "Smoothing",L5[LL]," Sample",K
80: 'IFARRA'(p1,K)+p5:(K-1)I[12]+p2
81: if K=I[14]+1:'IFARRAF'(p1)+p5:'TIMEF'(p1)+p2
82: 'ANGA'(p5)-p2p4-p3+p6
83: stf 14:for I=1 to E
84: p2+(I-1)+p7:MC[I,F]+p6p7+MC[I,F]
85: for J=I to E:MC[I,J]+p2+(I+J-2)+MC[I,J]:next J
86: next I:stf 14
87: "SkipSample":next K
88: for I=1 to E:for J=I to E:MC[I,J]+MC[J,I]:next J:next I
89: "Inv":for I=1 to D:if MC[I,I]#0:sto +5
90: for J=I+1 to E:if MC[J,I]=0:sto +2
91: for K=I to F:MC[I,K]+pK:MC[J,K]+MC[I,K]:pK+MC[J,K]:next K:sto +3
92: next J
93: dsp "Singular matrix in Inv routine"
94: for J=I+1 to E
95: MC[J,I]/MC[I,I]+U:for K=I to F:MC[J,K]-MC[I,K]U+MC[J,K]
96: next K:next J:next I:if MC[E,E]=0:sto -3
97: for I=E to 1 by -1:if I=E:sto +2
98: for J=I+1 to E:MC[I,F]-MC[I,J]pJ+MC[I,F]:next J
99: MC[I,F]/MC[I,I]+pI+MC[I,F]:next I:ret
9957
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0: wrt 6,"clone scan profile,2;tapeAT-FM,trl0,file9,rev121880"
1: "PLOT SMOOTHED PROFILE--ALONG SCAN":
2: dse "Load Data Sheet 4.3.4-1(p76)":istp
3: asirint 705,"IP571,806,8177,10960"
4: scl 1.8,5,1,11;csiz 1.3,2;pen# 1
5: dse "Alien paper using Two Boxes"
6: plt 1.18,1.89,1;lbl ".":plt 7.46,10.12,1;lbl ".":plt 10,10,1;istp
7: dse "Plotline":0+r1:1+r2;if I[81]>50:I[81]/50+r2
8: for I=1 to 2:for J=0 to I[81] by r2
9: max(abs('PROFILE'(I,0,J[I[12]])),r1)+r1;next J;next I
10: 1e6r1-r1/rnd(r1,1)+8;if r1>8:10+8+8
11: max(8,20)+8;scl -.1033Q[61],1.147Q[61],-1.319B,2.714B
12: fxd 0;max 0,.25Q[61],0,Q[61];yax 0,.5B,-B,B,4
13: "Measured":for I=1 to 2
14: if I=1:pen# 4;line 1:plt .78Q[61],-.69B;plt .93Q[61],-.69B;pen
15: if I=2:pen# 2;line 5:plt .78Q[61],-.73B;plt .93Q[61],-.73B;pen
16: 'ANGA'('IFARA'(I,1))+r3;('ANGA'('IFARA'(I))+r3)/'TIMEF'(I)+r4
17: for J=1 to I[14]+1
18: if J=I[14] and Q[69]=1;eto "SkipSampl"
19: (J-1)I[12]+r3;'IFARA'(I,J)+r5;if J=I[14]+1;'TIMEF'(I)+r2;'IFARA'(I)+r5
20: 'ANGA'('r5)-r2r4-r3+r6
21: if I=2:Q[61]-r3+r2
22: plt r2,r6r6
23: "SkipSampl":next J;pen;next I
24: "Smoothed":for I=1 to 2
25: if I=1:pen# 4;line 3:plt .78Q[61],-.6B;plt .93Q[61],-.6B;pen
26: if I=2:pen# 2;line 2,2:plt .78Q[61],-.65B;plt .93Q[61],-.65B;pen
27: 0+r0+r8;-1e10+MC1,I;1e10+MC2,I
28: 'ANGA'('IFARA'(I,1))+r3;('ANGA'('IFARA'(I))+r3)/'TIMEF'(I)+r4
29: for J=1 to I[14]+1;if J=I[81] and Q[69]=1;eto "SkipSampl"
30: (J-1)I[12]+r3;'IFARA'(I,J)+r5;if J=I[14]+1;'TIMEF'(I)+r2;'IFARA'(I)+r5
31: 'ANGA'('r5)-r2r4-r3+r6
32: 1e6'PROFILE'(I,0,r2)+r7;max(MC1,I,r7)+MC1,I;min(MC2,I,r7)+MC2,I
33: if I=2:Q[61]-r2+r2
34: plt r2,r7;r0+(1e6r6-r7)/2+r0;r8+1+r8
35: "SkipSampl":next J;pen;r(r0/r8)+r(10-Imod2);next I
36: "inflection pts":0+r14+r15
37: for I=1 to 2;'DERIV2'(I,0,0)+r16
38: for J=1 to I[14];if J=I[81] and Q[69]=1;eto "SkipSampl"
39: JI[12]+r23;if J=I[14];'TIMEF'(I)+r23
40: 'DERIV2'(I,0,r23)+r24;if r24#r16;r24+r16;r(15-Imod2)+1+r(15-Imod2)
41: "SkipSampl":next J;next I
42: "Label1":pen# 1;scl 1.8,5,1,11
43: fxd 1;plt 5.6,6.6,1;lbl r9;plt 6.65,6.6,1;lbl r10
44: plt 8,6.6,1;if r9<2.1 and r10<2.1;lbl "P";jmp 2
45: lbl "F"
46: fxd 0;plt 5.6,7.45,1;lbl r14;plt 6.65,7.45,1;lbl r15
47: plt 8,7.45,1;if r14<3 and r15<3;lbl "P";jmp 2
48: lbl "F"
49: plt 2.1,9.55,1;lbl Q[1,32]
50: plt 4.6,9.55,1;lbl Q[33,35]
51: plt 6.7,9.55,1;lbl C[1]
52: if 'MODE'=0;plt 3.8,9.65,1;lbl "SAM MODE"
53: plt 7.9,65,1;fxd 1;lbl Q[65],",Q[66],",Q[68]
54: for I=0 to D:plt 4.9,9-.25I,1
55: fxd 0;lbl I;plt 4;lbl " ",P[I+4],", ",P[I+14];next I
56: fxd 1;plt 5.6,7.08,1;lbl MC1,1]
57: plt 5.6,6.88,1;lbl MC2,1]
58: plt 6.65,7.08,1;lbl MC1,2]
59: plt 6.65,6.88,1;lbl MC2,2]
60: plt 8,7,1
61: for I=1 to 2;for J=1 to 2
62: if abs(MC1,J)>17.5;lbl "F";jmp 2

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62: next J:next I:lbl "P"
63: fxd 1:plt 1.6,9.2,1:lbl Q[53], " ",Q[51], " ",Q[54], " ",Q[52], " ",Q[55]
64: lbl " ",Q[57], " ",Q[56], " ",Q[59], " ",Q[60]
65: plt 1.5,8.9,1:fxd 3:lbl 1e3Q[2], " ",1e3Q[4]
66: plt 2.8,7.1:fxd 6:lbl Q[5]
67: plt 1.7,8.4,1:fxd 0:lbl C[9]-C[8]
68: for I=1 to 3:plt 1.7,8.4-.18I,1:lbl C[9-I]:next I
69: plt 1.7,8.4-(.18)4,1:lbl C[10]
70: for I=1 to 2
71: 'IFARA'(I,1)+r(3I-2);'IFARAM'(I)+r(3I-1);'IFARAF'(I)+r(3I):next I
72: for I=1 to 3:plt 3.7,8.5+(I-1).18,1:lbl rI:next I
73: for I=4 to 6:plt 3.7,8.22-(I-4).18,1:lbl rI:next I
74: 'ANGA'(rI)+r8;if I[6]2;'IFARA'(3,1)+r7:plt 3.7,7.68,1:lbl r7
75: for I=1 to 3:plt 1.3,6.9+.2(I-1),1:lbl 1e6('ANGA'(rI)-r8):next I
76: for I=4 to 6:plt 3.1,7.3-.2(I-4),1:lbl 1e6('ANGA'(rI)-r8):next I
77: if I[6]2:plt 3.1,6.7,1:lbl 1e6('ANGA'(r7)-r8)
78: plt 4.5,6.3,1:plt 2:lbl Q[70], " TORR PRESSURE"
79: plt 4.5,6.1,1:fxd 2:if P[45]=8 or P[45]=9:jmp 2
80: lbl "MIDSCAN PRESSURE CORRECTION:", 'PRESS'Q[70], " URAD"
81: plt 6.2,5.9,1:lbl "SAM OFFSET,urad":fxd 1
82: for I=1 to 3:plt 6.2,5.3+.2(I-1),1:lbl 1e6('ANGA'(rI)-'ANGA'(C[5+I]))
83: next I
84: for I=4 to 6:plt 7.2,5.7-.2(I-4),1:lbl 1e6('ANGA'(rI)-'ANGA'(C[12-I]))
85: next I
86: plt 5.2,1,1:lbl "data for smoothed profile :",D$[P[45]-3]
87: plt 5.1,9,1:lbl "data for measured profile :",D$[P[45]-P[45]mod2-3]
88: plt 1.9,1.5,1:fxd 4:lbl Q[1]+Q[2]/1e4
89: plt 2.1,1.3,1:fxd 0:lbl Q[36,36], "-",Q[43,44], " seq ",Q[3]
90: plt 1.7,1.05,1:lbl "test no.",Q[43,44]
91: plt 6.8,1.6,1:lbl Q[1]:pen#
92: "PLOT NESTED AND NON-NESTED":
93: dsp "Load Data Sheet 4.3.4-2(p77)":istp
94: scl 1.8,5,1,1:csiz 1.3,2:pen# 1
95: dsp "Align paper using two boxes"
96: plt 1.18,.39,1:lbl ".":plt 7.46,10.12,1:lbl ".":plt 10,10,1:istp
97: dsp "Plottine":scl -.1Q[6],1.15Q[6],-1.3198,2.7148
98: fxd 0:line ixax 0,.25Q[6],0,Q[6]:yax 0,.58,-8,B,4
99: int(I[14]/2)+r11:for I=1 to 4
100: if I=1:pen# 4:line 3,4:plt .72Q[6],1.58:plt .85Q[6],1.58:pen
101: if I=2:pen# 2:line 2,2:plt .72Q[6],1.468:plt .85Q[6],1.468:pen
102: if I=3:pen# 1:line 5,4:plt .72Q[6],1.418:plt .85Q[6],1.418:pen
103: if I=4:pen# 3:line 1:plt .72Q[6],1.368:plt .85Q[6],1.368:pen
104: (I+1)mod2+1+r10:for J=0 to I[14]:J[I[12]+r18]:if J=I[14]:'TIMEF'(r10)+r18
105: if I[3]:sto "FwdRev"
106: "Nested/Non-Nested":'PROFILE'(1,0,r18)+r19;'PROFILE'(2,0,Q[6]-r18)+r20
107: 1e6(r19+(-1)^(I-1)r20)/2+r21:plt r18,r21:if J=r11:r21+r(16-I mod2)
108: sto "EndTrace"
109: "FwdRev":1e6'PROFILE'(I,0,r18)+r22:if I=2:Q[6]-r18+r18
110: plt r18,r22
111: "EndTrace":next J:pen:next I
112: "Label2":pen# 1:scl 1.8,5,1,1
113: if 'MODE'=0:plt 3.7,9.65,1:lbl "SAM MODE"
114: plt 2.1,9.5,1:lbl Q[1,32]
115: plt 4.6,9.5,1:lbl Q[33,35]
116: plt 6.7,9.55,1:lbl C[1]
117: plt 5.8,9.1,1:fxd 1:lbl Q[65], " ",Q[66], " ",Q[58]
118: plt 2.5,8.4,1:lbl " FWD REV"
119: 30371.4-'LINE'(2,2.5,1.5)+r1:30371.6-'LINE'(2,1,1.5)+r2
120: 30371.4-'LINE'(3,2.5,1.5)+r3:30371.6-'LINE'(3,1,1.5)+r4
121: r1+r2+r5:r3+r4+r6
122: fxd 2:plt 1.8,2,1:lbl "PERIOD":plt 2.5,8.2,1:lbl r5:plt 3.5,8.2,1:lbl r6
123: plt 1.8,1:lbl "1st HALF":plt 2.5,8,1:lbl r1:plt 3.5,8,1:lbl r3
124: plt 1.7,8,1:lbl "2nd HALF":plt 2.5,7.8,1:lbl r2:plt 3.5,7.8,1:lbl r4
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136: cll 'MGC'(1);c11 'MGC'(2)
137: elt 1.7.6.1;1bl 'PHIm'
138: elt 2.5.7.5.1;1bl r7;elt 3.5.7.6.1;1bl r8
139: elt 1.7.4.1;1bl 'PHIro,PHIro';r11+P[49];r12+P[50]
140: elt 2.5.7.4.1;1bl -r11;elt 3.5.7.4.1;1bl -r12
141: elt 1.3.9.2.1;fxd 6;1bl C[5]
142: elt 3.6.8.1.1;fxd 2;1bl r9
143: elt 2.6.8.95.1;1bl r10
144: elt 2.6.8.8.1;fxd 2;1bl r15
145: elt 2.6.8.65.1;1bl r16
146: elt 3.6.8.9.1;1bl "from SMOOTHED PROFILES"
147: elt 1.6.1.5.1;fxd 4;1bl Q[1]+Q[2]/1e4
148: elt 2.1.1.3.1;fxd 0;1bl Q[36,36], "-",Q[43,44], " sea ",Q[3]
149: elt 1.7.1.1.1;1bl "test no.",Q[43,44], "1 FWD/1 REV SCAN, 400pts each"
150: elt 6.8.1.6.1;1bl Q[1]
151: elt 5.2.1;1bl "data for smoothed profile :",D[P[45]-3]
152: pen#
153: "SAVE COEFFICIENTS":0+r1
154: if P[1]=Q[1] and P[2]=Q[2];eto "RECORD"
155: dsp "Incorrect Smooth Coeffs Data File";end
156: "RECORD":r1+i-r1;if r1=1;dsp "Insert Data Tape",Q[37,42], "NOMINAL";sto
157: if r1=2;dsp "Insert Data Tape",Q[37,42], "RESERVE";sto
158: dsp "recording smooth coeffs"
159: trk T[1];rof T[5],P[*]
160: if r1=1;eto "RECORD"
161: dsp "finished";end
162: "SUBROUTINES":
163: "ANGA":asn((2(p1-C[11])+C[13])/r(4C[12]+2+C[13]+2))>p2
164: ret p2-atn(.5C[13]/C[12])
165: "DERIV2":3+21p2>p4;p4+10((p1+1)mod2)+1>p5;0>p6;if P[p4]K3;jmp 2
166: for L=3 to P[p4];p6+L(L-1)P[L+5]p3+(L-2)>p6;next L
167: ret asn(p6+2P[2+p5])
168: "IFARA":10+4p2-3>p3;if p1#1;2itf(W[2p1-3,2p1-2])+4p2-3>p3
169: cmpitf(S[p3+2,p3+3])>p4;cmpitf(S[p3,p3+1])>p5
170: ret 2+16shf(p5,12)+2shf(p4,1)+shf(shf(p4,-15),15)-C[14]
171: "IFARAF":2(itf(W[2p1-1,2p1])+3)-61>p2;if p1=I[6];p2+2>p2
172: cmpitf(S[p2+2,p2+3])>p3;shf(shf(p3,-15),15)+2shf(p3,1)>p4
173: ret p4+2+16shf(cmpitf(S[p2,p2+1]),12)-C[14]
174: "IFARAM":2(itf(W[2p1-1,2p1])+7)-61>p2;if p1=I[6];p2+2>p2
175: cmpitf(S[p2+2,p2+3])>p3;shf(shf(p3,-15),15)+2shf(p3,1)>p4
176: ret p4+2+16shf(cmpitf(S[p2,p2+1]),12)-C[14]
177: "LINE":2itf(W[2p1-1,2p1])-60>p7;if p1=I[6];p7+2>p7
178: 0>p10;for M=0 to p3-.5 by .5
179: p2+M>p5;int(p5)>p6
180: p6+2(p6mod2)-1>p12;8(p5mod1)>p13
181: itf(S[p7+p12-1,p7+p12])>p8;shf(shf(p8,-8),8)>p8
182: 0>p9;for L=0 to 3;p9+2+(3-L)bit(L+p13,p8)>p9;next L
183: 16p10+p9+p10;next M;p10>R;if p4=1;jmp 2
184: if 16+(p3/.5)/2-1<p10;p10-16+(p3/.5)>p10
185: p10>P;p10/5.3064375>p11;ret p11
186: "MGC":p1mod2>p8
187: Q[2]+p2;C[4]+p4;p2/(p2-p4)>p3;if p8=0;p4/(p4-p2)>p3
188: "LINE"(p1+1,2.5,1.5)>p5;"LINE"(p1+1,1,1.5)>p6;60743-p5-p6>p7
189: 30371.4-p5>p11;p13;30371.6-p6>p12;if P[45]=6 or P[45]=7;1e6Q[6]p11/p7>p1
190: (p3-1)p11+p3p12>p9;1e6(p4-p2)/p7>p10;if p8=0;-p10>p10
191: 1e6"PROFILE"(p1,0,1e-6p13)+r(10-p8);p9p10>p14+r(8-p8)
192: (-1)>p8"PRESS"Q[70]p15
193: -p14-p15>r(12-p8);ret
194: "MODE":c11 'TELE'(1,2);ret bit(5,R)
195: "MIDSCAN":'ANGA'('IFARA'(p1,1))>p3
196: ('ANGA'('IFARAF'(p1))-p3)/'TIMEF'(p1)>p4
197: 'TIMEN'(p1)>p2;'ANGA'('IFARAM'(p1))>p5

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188: 1e6(p5-p2p4-p3)+p6;ret p6
189: "PRESS":ret itf(S[9,10])/100
190: "PROFILE":3+21p2+p4;p4+10((p1+1)mod2)+1+p5;0+p6;for L=1 to P[p4]
191: p6+P[p5+L]p3TL+p6;next L;ret p6+P[p5]
192: "TELE":3itf(W[2p1-1,2p1])-34+p6;if p1=I[6];p6+2+p6
193: 0+p9;for M=2 to 5;if pM=0;jmp 4
194: pM+2(pMmod2)-1+p11;itf(S[p6+p11-1,p6+p11])+p7;shf(shf(p7,-8),2)+p7
195: 0+p8;for L=0 to 7;p8+2((7-L)bit(L,p7)+p8;next L;p8+R
196: 256p9+p8+p9;next M
197: if 256((M-2)/2-1(p9;p9-256((M-2)+p9
198: p9+P[p9/S.3064375+p10+T;ret p10
199: "TIMEF":2(itf(W[2p1-1,2p1])+5)-61+p2;if p1=I[6];p2+2+p2
200: cmpitf(S[p2,p2+1])+p3;cmpitf(S[p2+2,p2+3])+p4
201: 2shf(p4,1)+shf(shf(p4,-15),15)+216shf(shf(p3,-12),12)+p5
202: ret (p5-I[10])/Q[5]+I[11]
203: "TIMEM":2(itf(W[2p1-1,2p1])+9)-61+p2;if p1=I[6];p2+2+p2
204: cmpitf(S[p2,p2+1])+p3;cmpitf(S[p2+2,p2+3])+p4
205: 215shf(p3,1)+214shf(shf(p3,-15),15)+shf(p4,12)+p5
206: 'IFARAM'(p1)+p6;for M=int(I[8]/2.1) to I[8];'IFARA'(p1,M)+p7
207: if abs(p6-p7)>abs('IFARA'(p1,M+1)-p7);next M
208: ret (p5-I[10])/Q[5]+(M-1)I[12]
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0: fmt 1,"along scan profile,3;tapeAT-FM,trl0,file10,rev121880"
wrt 6.1
"PLOT SMOOTHED PROFILE--ALONG SCAN":
3: dsp "Load Data Sheet 4.3.4-1(p76)"istp
pclriwrt 705,"IP571,806,0177,10960"
scl 1,8.5,1,11;csiz 1.3,2;pen# 1
6: dsp "Alien paper using Two Boxes"
7: plt 1.18,.89,1;lbl ".":plt 7.46,10.12,1;lbl ".":plt 10,10,1;listp
dsp "Plotting";0+r1;1+r2;if I[8]>30;I[8]/50+r2
for I=1 to 2;for J=0 to I[8] by r2
10: max(abs('PROFILE'(I,0,J)I[12])),r1)+r1;next J;next I
11: 1e6r1+r1;prnd(r1,1)+B;if r1>B;10+B+B
12: max(B,20)+B;scl -.1033Q[6],1.147Q[6],-1.319B,2.714B
13: fxd 0;xax 0,.25Q[6],0,Q[6];yax 0,.5B,-B,B,4
14: "Measured":for I=1 to 2
15: if I=1;pen# 4;line 1;plt .78Q[6],-.69B;plt .93Q[6],-.69B;pen
16: if I=2;pen# 2;line 5;plt .78Q[6],-.73B;plt .93Q[6],-.73B;pen
17: 'ANGA'('IFARA'(I,1))+r3;('ANGA'('IFARA'(I))-r3)/'TIMEF'(I)+r4
18: for J=1 to I[14]+1
19: if J=I[14] and Q[69]=1;eto "SkipSamp1"
20: (J-1)I[12]+r2;'IFARA'(I,J)+r5;if J=I[14]+1;'TIMEF'(I)+r2;'IFARA'(I)+r5
21: 'ANGA'(r5)-r2r4-r3+r6
22: if I=2;Q[6]-r2+r2
23: plt r2,1e6r6
24: "SkipSamp1":next J;pen;next I
25: "Smoothed":for I=1 to 2
26: if I=1;pen# 4;line 3;plt .78Q[6],-.6B;plt .93Q[6],-.6B;pen
27: if I=2;pen# 2;line 2,2;plt .78Q[6],-.65B;plt .93Q[6],-.65B;pen
28: 0+r0+r8;-1e10+M[1,I];1e10+M[2,I]
29: 'ANGA'('IFARA'(I,1))+r3;('ANGA'('IFARA'(I))-r3)/'TIMEF'(I)+r4
30: for J=1 to I[14]+1;if J=I[8] and Q[69]=1;eto "SkipSamp2"
31: (J-1)I[12]+r2;'IFARA'(I,J)+r5;if J=I[14]+1;'TIMEF'(I)+r2;'IFARA'(I)+r5
32: 'ANGA'(r5)-r2r4-r3+r6
33: 1e6'PROFILE'(I,0,r2)+r7;max(M[1,I],r7)+M[1,I];min(M[2,I],r7)+M[2,I]
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34: if I=2:Q[61]-r2+r2
35: el: r2-r7:r0+1:1e6r6-r7)+2+r0:r8+1+r8
36: "SkipSamp2":next J:pen:r(r0/r8)+r(10-Imod2):next I
37: "Infection pos":0+r14+r15
38: for I=1 to 2:"DEIV2"(1,0,0)+r16
39: for J=1 to I[14]:if J=I[2] and Q[69]=1:eto "SkipSamp3"
40: J[12]+r23:if J=I[14]:"TIMEF"(1)+r23
41: "DEIV2"(1,0,r23)+r24:if r24#r16:r24+r16:r(15-Imod2)+1+r(15-Imod2)
42: "SkipSamp3":next J:next I
43: "Label1":scl 1,8,5,1,1:pen# 2
44: fnd 1:elt 5.6,6.6,1:lbl r9:elt 6.65,6.6,1:lbl r10
45: elt 8,6.6,1:lbl "-"
46: fnd 0:elt 5.6,7.45,1:lbl r14:elt 6.65,7.45,1:lbl r15
47: elt 8,7.45,1:lbl "-"
48: elt 2,1,9.55,1:lbl Q[1,32]
49: elt 4,6,9.55,1:lbl Q[33,35]
50: elt 6,5,9.55,1:lbl Q[1]
51: i: "MODE":1:elt 3,8,9.65,1:lbl "BUMPER MODE"
52: elt 7,9.65,1:fnd 1:lbl Q[651],"",Q[661],"",Q[58]
53: for I=0 to D:elt 4,9,9-.25I,1
54: fnd 0:lbl 1:elt 4:lbl " . . .",P[I+4]," . . .",P[I+14]:next I
55: fnd 1:elt 5,6,7.08,1:lbl M[1,1]
56: elt 5,6,6.88,1:lbl M[2,1]
57: elt 6,65,7.08,1:lbl M[1,2]
58: elt 6,65,6.88,1:lbl M[2,2]
59: elt 6,7,1:lbl "-"
60: fnd 1:elt 1,9,2,1:lbl Q[531],"",Q[511],"",Q[541],"",Q[521],"",Q[551]
61: lbl " . . .",Q[571],"",Q[561],"",Q[591],"",Q[601]
62: elt 1,9,3,9,1:lbl 1e3Q[21],"",1e3Q[4]
63: elt 3,8,7,1:fnd 8:lbl Q[5]
64: elt 1,7,8,04,1:fnd 4:lbl "FROM TFEG RUN",Q[1]+Q[2]/1e4
65: elt 4,5,6,3,1:flt 2:lbl Q[70],"TORR PRESSURE"
66: elt 4,5,6,1,1:fnd 2:if P[45]=8 or P[45]=9:Jmp 2
67: lbl "MIDSCAN PRESSURE CORRECTION:",P[55],Q[70]," URAD"
68: elt 5,2,1,1:lbl "data for smoothed profile :",D[P[45]-3]
69: elt 5,1,9,1:lbl "data for measured profile :",D[P[45]-P[45]mod2-3]
70: elt 1,6,1,5,1:fnd 4:lbl Q[1]+Q[2]/1e4
71: elt 2,1,1,3,1:fnd 0:lbl Q[36,36],"-",Q[43,44]," see ",Q[3]
72: elt 1,7,1,05,1:lbl "test no.",Q[43,44]
73: elt 6,8,1,6,1:lbl Q[1]:pen#
74: "PLOT NESTED AND NON-NESTED":
75: dse "Load Data Sheet 4.3.4-2(p77)":sto
76: scl 1,8,5,1,1:csiz 1,3,2:pen# 1
77: dse "Align paper using two boxes"
78: elt 1,18,.89,1:lbl " . . .":elt 7,46,10,12,1:lbl " . . .":elt 10,10,1:sto
79: dse "Plottime":scl -1,1Q[61],1,15Q[61],-1,3198,2,7148
80: fnd 0:line ixax 0,.25Q[61],0,Q[61]:yax 0,.58,-8,8,4
81: int(I[14]/2)+r11:for I=1 to 4
82: if I=1:pen# 4:line 3,4:elt .72Q[61],1.58:elt .85Q[61],1.58:pen
83: if I=2:pen# 2:line 2,2:elt .72Q[61],1.468:elt .85Q[61],1.468:pen
84: if I=3:pen# 1:line 5,4:elt .72Q[61],1.418:elt .85Q[61],1.418:pen
85: if I=4:pen# 3:line 1elt .72Q[61],1.368:elt .85Q[61],1.368:pen
86: (I+1)mod2+1+r10:for J=0 to I[14]:J[12]+r18:if J=I[14]:"TIMEF"(r10)+r18
87: if I=3:eto "FndRev"
88: "Nested/Non-Nested":'PROFILE'(1,0,r18)+r19:'PROFILE'(2,0,Q[61]-r18)+r20
89: 1e6(r19+(-1)^(I-1)r20)/2+r21:elt r18,r21:if J=r11:r21+r(13-Imod2)
90: eto "EndTrace"
91: "FndRev":1e6'PROFILE'(1,0,r18)+r22:if I=2:Q[61]-r18+r18
92: elt r18,r22
93: "EndTrace":next J:pen:next I
94: "Label2":scl 1,8,5,1,1:pen# 2
95: if "MODE":1:elt 3,7,9.65,1:lbl "BUMPER MODE"
96: elt 2,1,9.5,1:lbl Q[1,32]

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07: p1=3.5-9.5+1:bl 0:[33,35]
08: p1=5.7-1.55+1:bl C[1]
09: m1=5.8-9.1+1:rd 1:bl Q[65], " ", Q[66], " ", Q[58]
10: p1=1.5-9.2+1:rd 4:bl "TFEG RUN", Q[1]+Q[2]*1e4
11: p1=2.5-9.1+1:rd 1:bl "TELE"(2,3)
12: p1=2.5-9.95+1:bl "TELE"(3,3)
13: p1=2.5-9.8+1:rd 1:bl "----"
14: p1=2.5-9.85+1:bl "----"
15: p1=1.5-1.5+1:rd 4:bl Q[1]+Q[2]*1e4
16: p1=2.1-1.3+1:rd 0:bl Q[36,36], "-", Q[43,44], " seq ", Q[3]
107: p1=1.7-1.1+1:bl "test no.", Q[43,44]
108: p1=6.8-1.6+1:bl Q[1]
109: p1=5.2+1:bl "data for smoothed profile :", D[P[45]-3]
110: rem
111: "SAVE COEFFICIENTS":0+r1
112: r1=P[1]-Q[1] and P[2]=Q[2]:sto "RECORD"
113: do "Import Smooth Coeffs Data File":end
114: RECORD:r1+1:r1:if r1=1:dsp "Insert Data Tape", Q[37,42], "NOMINAL":sto
115: if r1=2:dsp "Insert Data Tape", Q[37,42], "RESERVE":sto
116: dsp "recording smooth coeffs"
117: r1=T[1]:ct T[5],P[+]
118: if r1=:sto "RECORD"
119: loop finished:end
120: "END OF LINE":
121: p1=(p1+(2*(p1-C[11])+C[13])/r(40[12]+2+C[13]+2))+p2
122: p1=C[13]-C[13]:C[13]
123: p1=p1+3+2*p2+p4+10*((p1+1)mod2)+1+p5;0+p5;if P[p4]<3;jmp 2
124: for L=0 to P[p4]:p5=L(L-1)/2:P[L+p5];p3+(L-2)*p6;next L
125: ret 3:p5+2P[2+p5]
126: "IFAPA":10+p3-3-p3;if p1#1:2:itf(W#[2p1-3,2p1-2])+4p2-3+p3
127: cmpitf(S#[p3+2,p3+3])+p4:cmpitf(S#[p3,p3+1])+p5
128: ret 2:16shf(p5,12)+2shf(p4,1)+shf(shf(p4,-15),15)-C[14]
129: "IFAPAF":2:itf(W#[2p1-1,2p1]+3)-61+p2;if p1=I[6]:p2+2+p2
130: cmpitf(S#[p2+2,p2+3])+p3:shf(shf(p3,-15),15)+2shf(p3,1)+p4
131: ret p4+2:16shf(cmpitf(S#[p2,p2+1]),12)-C[14]
132: "IFAPAN":2:itf(W#[2p1-1,2p1]+7)-61+p2;if p1=I[6]:p2+2+p2
133: cmpitf(S#[p2+2,p2+3])+p3:shf(shf(p3,-15),15)+2shf(p3,1)+p4
134: ret p4+2:16shf(cmpitf(S#[p2,p2+1]),12)-C[14]
135: "MODE":1:1:"TELE"(1,2):ret bit(5,R)
136: "PRESS":ret itf(S#[9,10])/100
137: "PROFILE":3+2*p2+p4;p4+10*((p1+1)mod2)+1+p5;0+p5;for L=1 to P[p4]
138: p5=P[p5]+L;p3L+p6;next L:ret p6+P[p5]
139: "TIMEF":2:itf(W#[2p1-1,2p1]+5)-61+p2;if p1=I[6]:p2+2+p2
140: cmpitf(S#[p2,p2+1])+p3:cmpitf(S#[p2+2,p2+3])+p4
141: 2shf(p4,1)+shf(shf(p4,-15),15)+2:16shf(shf(p3,-12),12)+p5
142: ret (p5-I[10])/Q[5]+I[11]
143: "TELE":2:itf(W#[2p1-1,2p1])-34+p6;if p1=I[6]:p6+2+p6
144: 0+p9;for M=2 to 5:if p1=M:jmp 4
145: pM+2:pMmod2)-1+p11:itf(S#[p6+p11-1,p6+p11])+p7:shf(shf(p7,-8),8)+p7
146: 0+p8;for L=0 to 7:p8+2:(7-L)bit(L,p7)+p8;next L:p8+R
147: 256p9+p8+p9;next M
148: it 256(M-2)/2-1:p9:p9-256(M-2)+p9
149: p9-P:p9-5.3064375+p10:T:ret p10

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TS 32015-004
Rev B

DATA SHEET 5.2.1

TEST COMPUTER

PROGRAM LISTINGS

PROGRAM NAME: _____

SMA Designation F-1 S/N 4 BAND TO BAND REGISTRATION
TAPE F-1 TRK 0 FILE 11 SHEET 1 OF _____

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0: fnt 1:"scan rate variation(BtoB Res);tapeRT-FM, trk0, file11, rev12188
1: wrt 6.1;fxd 0;rad
2: dim C[25]; I[15]; Q[70]; Q$[50]; T[10]
3: dim K[2,3]; D$[6,8]; "FWD"→K$[1]; "REV"→K$[2]
4: "CORR"→D$[1]; "CORR/AVG"→D$[2]; "NORM"→D$[3]; "NORM/AVG"→D$[4]
5: "RAW"→D$[5]; "RAW/AVG"→D$[6]
6: 2.211051→r4; 2.2125e-5→r5
7: dsp "Insert Data Tape";stp
8: ent "Track for Data?";r20
9: ent "File for Init/Cal Data?";r22
10: dsp "Loading Init/Cal Data"
11: trk r20;ldf r22,C[*];I[*];Q[*];Q$[*];T[*]
12: fnt 1:"Data Date: ";fz6.0;5x;"Data Time: ";fz4.0;wrt 6.1;Q[1];Q[
13: fnt 1:"SMA Designation: ";3x;32ciwrt 6.1;Q$[1,32]
14: fnt 1:"Serial Number: ";5x;3ciwrt 6.1;Q$[33,35]
15: fnt 1:"Test Flow Event: ";3x;1ciwrt 6.1;Q$[36,36]
16: fnt 1:"Sequence Number: ";f4.0;wrt 6.1;Q[3]
17: fnt 1:"Data Tape Identifier: ";14x;6ciwrt 6.1;Q$[37,42]
18: fnt 1:"Track for Data: ";f21.0;wrt 6.1;T[1]
19: fnt 1:"Init/Cal Data File Number: ";f10.0;wrt 6.1;T[2]
20: fnt 1:"Scan Data File Number: ";f14.0;wrt 6.1;T[3]
21: fnt 1:"Norm/Avg Scan Data File Number: ";f5.0;wrt 6.1;T[4]
22: fnt 1:"Smoothing Coeffs File Number: ";f7.0;wrt 6.1;T[5]
23: 0→P;ent "print all data?(1=y,0=n)";P
24: "GET DATA":
25: dim S$[T[6]];W$[T[7]];buf "SCAN";S$,4;trk T[1]
26: 3er1;jmp 3
27: dsp "Data for Computation";wait 2000
28: ent "3=RAW,4=CORR";r1;if r1<3 or r1>4;jmp 0
29: dsp "loading SCAN data, file";T[r1];ldf T[r1];S$,W$
30: shf(itf(S$[1,2]);8)mod16→r0
31: dsp "only";D$[r0-3];"is available";stp
32: if r0mod2=0;jmp 3
33: dsp "select";r0-1;"=";D$[r0-4];";";r0;"=";D$[r0-3];stp
34: ent "ent selection";r0
35: fnt 1:"DATA USED FOR COMPUTATIONS = ";3ciwrt 6.1;D$[r0-3];wrt 6
36: 1→r16;I[6]→r17;if r0mod2=1;I[6]+1→r16;r16+1→r17
37: 75→r7;ent "Band Separation (IFOV units)";r7
38: int(r7r5/r4I[12]+.5)→K;if K=0;1→K
39: fnt 1:"Desired Band Separation: ";f25.1;" IFOV";wrt 6.1;r7
40: K[I[12]r4-r8;K[I[12]C[41-C[21]]→r2

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42: fnt 1.5: "Based on:", f5.0, " Samples Separation", /iurt 6.1, K
43: dsp "Check Printer Data":stp
44: "PLOTTER INITIALIZATION":
45: dsp "Insert Data Sheet 4.3.4-3(p78)":stp
46: pclrurt 705, "IP571,806,8177,10960"
47: scl 1.8.5,1,11:csiz 1.3,2:pen# 1
48: dsp "Align paper using two boxes"
49: plt 1.12,1.89:pen:plt 7.38,10.12:plt 10,10,1:stp
50: .5+Q: fnt 1.4, "Vertical Scale Q = ", f5.2, " Percent", /iurt 6.1, Q
51: "dsp "Change Scale Q, if desired":stp:
52: scl -.09567Q[61,1.153Q[61,-1.63Q[61,2.4Q[61: dsp "Plotting"
53: lim -.0972Q[61,1.16Q[61,-1.63Q[61,2.4Q[61: pen# 1: fxd 1
54: xax 0, .25Q[61,0,Q[61: 0+r18: if Q#.1: 2+r18
55: yax 0,0/2,-0,0,r18
56: "SCAN RATE VARIATION":
57: 0-A: for I=1 to I[61-1: if 'IFARA'(I,I[14])='IFARAF'(I): 1+A
58: next I: I[14]-K+r10: if A=1: r10-1+r10
59: 0+r14+r15
60: 1+r16: 2+r17: if r0mod2=1: I[61]+1+r16: r16+1+r17
61: for I=r16 to r17: fnt 1.4, "Scan Number:", f5.0: iurt 6.1, 1: if P=0: jmp 4
62: fnt 1.4, "Sample", 8x, "Angle", 5x, "Separation", 5x, "Res Error": iurt 6.1
63: fnt 1.14x, "urad", 9x, "urad", 9x, "percent": iurt 6.1
64: fnt 1.4, f5.0, f15.2, f12.2, f14.4
65: lmod2+r9: 1+ r0mod2=1: (I[61]+I)mod2+r9
66: if r9=1: 1+r19: pen# 4: line
67: if r9=0: -1+r19: pen# 2: line 5
68: r2/'TIMEP'(I)+r26: for J=1 to r10
69: 'ANGA'('IFARA'(I,J))+r11: 'ANGA'('IFARA'(I,J+K))-r11+r12
70: 100r19/(r12-r19r28)/r28+r13: abs(r13)+r21
71: if r21>1: dsp "Warning: Percent Error=", r21: beep: wait 5000
72: max(r21,r(15-r9))+r(15-r9): cll 'STOIA'(I,J,1e6r21)
73: if P=1: iurt 6.1, J, 1e6r11, 1e6r12, r13
74: (J-1)I[12]+r3: if r9=0: Q[61]-r3+r3
75: plt r3, r13
76: next J: pen
77: fnt 1.4, "Max Registration Error:", f10.4, " Percent", /iurt 6.1, r(15-r9)
78: next I: pen#
79: "FIND SCAN RATE OVER 90% OF SCAN":
80: min(r10,int(.9I[8]))+r6: for I=r16 to r16+1
81: lmod2+r9: if r0mod2=1: (I[61]+I)mod2+r9
82: if r9=r10/(15-r9)+r(24-r9): sto "End90%"
83: fxd 0: for K=r10 to r6 by -1: dsp "Scan", 2-r9, " Sample", K: 0+r25
84: for J=1 to r10: 'IFARA'(I,J)+r26: if r26>r25: r26+r25: J+r27
85: next J: cll 'STOIA'(I,r27,0): next K: 1e-6r25+r(24-r9)
86: "End90%": next I: dsp " "
87: "LABEL PLOT":
88: scl 1.8.5,1,11: pen# 1
89: 'MODE'+r29: plt 3.7,9.65,1: if r29=0: lbl "SAM MODE"
90: if r29=1: lbl "BUMPER MODE"
91: plt 2,9.5,1: lbl Q#[1,32]
92: plt 4,6,9.5,1: lbl Q#[33,35]
93: fxd 0: plt 6,6,9.5,1: lbl Q[1]
94: plt 5,8,9.1,1: fxd 1: lbl Q[65], " ", Q[66], " ", Q[58]
95: fxd 1: plt 2,9,1,1: lbl "BAND SEPARATION = ", r8/r5, " IFOV"
96: plt 4,5,9,1,1: lbl "( ", 1e6r8, " URAD)"
97: fxd 3: plt 4,8.52,1: lbl r14
98: plt 4,8,8.52,1: lbl r15
99: plt 4,8,1: lbl r23
100: plt 4,8,8,1: lbl r24
101: plt 5,5,8,1: lbl "+- .094%"
102: plt 6,3,8,2,1: if r23<.094 and r24<.094: lbl "P": jmp 2
103: lbl "F"
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104: alt 4,2,1;lbl "data used for computations = ",D#[r0-3]
105: fvd 4;alt 1.5,1.5,1;lbl Q[1]+Q[2]/1e4
106: alt 2,1,3,1;lbl Q#[36,36], "-",Q#[43,44], "    sea ",Q[3]
107: alt 1,7,1,1,1;lbl "test no.",Q#[43,44]
108: pen# 4;alt 7,8,3,1;lbl "FWD";plt 7,3,8,3,1;line ;plt 7,8,8,3,2
109: pen# 2;plt 7,8,1,1;lbl "REV";plt 7,3,8,1,1;line 5,3;plt 7,8,8,1,2
110: pen# ;dso "finished";end
111: "SUBROUTINES":
112: "ANGA":asn((2(p1-C[11])+C[13])/r(4C[12]†2+C[13]†2))+p2
113: ret p2-atn(.5C[13]/C[12])
114: "IFARR":10+4p2-3+p3;if p1#1;2itf(W#[2p1-3,2p1-2])+4p2-3+p3
115: cmpitf(S#[p3+2,p3+3])→p4;cmpitf(S#[p3,p3+1])→p5
116: ret 2†16shf(p5,12)+2shf(p4,1)+shf(shf(p4,-15),15)-C[14]
117: "IFARAF":2itf(W#[2p1-1,2p1])-58+3+p2;if p1=I[6];p2+2→p2
118: cmpitf(S#[p2+2,p2+3])→p3;shf(shf(p3,-15),15)+2shf(p3,1)→p4
119: ret p4+2†16shf(cmpitf(S#[p2,p2+1]),12)-C[14]
120: "STDIR":10+4p2-3+p4;if p1#1;2itf(W#[2p1-3,2p1-2])+4p2-3+p4
121: "stoid":p3+C[14]→p7
122: shf(shf(cmpitf(S#[p4,p4+1]),-4),4)+2†12int(p7/2†16)→p5
123: cll 'STORE'(p5,p4);2†16frc(p7/2†16)→p6;cll 'STORE'(p6,p4+2);ret
124: "STORE":if p1>2†15-1;p1-2†16→p1
125: fsi (cnpol)+S#[p2,p2+1];ret
126: "MODE":cll 'TELE'(1,2);ret bit(5,R)
127: "TELE":2itf(W#[2p1-1,2p1])-34+p6;if p1=I[6];p6+2→p6
128: 0→p5;for M=2 to 5;if pM=0;jmp 4
129: pM+2(pM-mod2)-1→p11;itf(S#[p6+p11-1,p6+p11])→p7;shf(shf(p7,-8),8)→p7
130: 0→p8;for L=0 to 7;p8+2†(7-L)bit(L,p7)→p8;next L;p8→R
131: 256p9+p8→p9;next M
132: if 256†(M-2)/2-1<p9;p9-256†(M-2)→p9
133: p9→P;p9/5.3064375→p10→T;ret p10
134: "TIMEF":2itf(W#[2p1-1,2p1])-58+7+p2;if p1=I[6];p2+2→p2
135: cmpitf(S#[p2,p2+1])→p3;cmpitf(S#[p2+2,p2+3])→p4
136: 2shf(p4,1)+shf(shf(p4,-15),15)+2†16shf(shf(p3,-12),12)→p5
137: ret (p5-I[10])/Q[5]+I[11]
138: "Last r=29":
*923

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TS 32015-004
Rev 3

DATA SHEET 5.2.1

TEST COMPUTER

PROGRAM LISTINGS

PROGRAM NAME: _____

SMA Designation P-1 S/N 4 CROSS SCAN PROFILE
TAPE P-1 TRK 0 FILE 12.13.14 SHEET 1 OF 1

```
0: fnt 1;"cross scan profile;1;tapeAT-FM, trk0, file12, rev121880"
1: wrt 6.1
2: dim D$(6,3); "CORR"→D$(1); "CORR AVG"→D$(2); "NORM"→D$(3); "NORM AVG"→D$(4)
3: "RAW"→D$(5); "RAW AVG"→D$(6)
4: dim Q$(35), I(15), Q(70), Q$(50), T(10)
5: fnd 0:rad
6: dsp "Insert Data Tape";sto
7: ent "Track for Data?";r0
8: ent "File for Init/Cal Data?";r1
9: dsp "Loading Init/Cal Data"
10: trk r0;ldf r1,C[*],I[*],Q[*],Q$,T[*]
11: ent "Print all data? (1=y,0=n)";P
12: fnt 1;"/, "Data Date: ",fz6.0,5x,"Data Time: ",fz4.0;wrt 6.1,Q$(1),Q
13: fnt 1;"/, "SMA Designation: ",3x,32c;wrt 6.1,Q$(1,32)
14: fnt 1;"Serial Number: ",5x,3c;wrt 6.1,Q$(33,35)
15: fnt 1;"Run Number: ",7x,f11.4;wrt 6.1,Q(1)+Q(2)/1e4
16: fnt 1;"Test Flow Event: ",3x,1c;wrt 6.1,Q$(36,36)
17: fnt 1;"Sequence Number: ",f4.0;wrt 6.1,Q(3)
18: fnt 1;"/, "Data Tape Identifier: ",14x,6c;wrt 6.1,Q$(37,42)
19: fnt 1;"Track for Data: ",f21.0;wrt 6.1,T(1)
20: fnt 1;"Init/Cal Data File Number: ",f10.0;wrt 6.1,T(2)
21: fnt 1;"Scan Data File Number: ",f14.0;wrt 6.1,T(3)
22: fnt 1;"Norm/Avg Scan Data File Number: ",f5.0;wrt 6.1,T(4)
23: fnt 1;"Smoothing Coeffs File Number: ",f7.0,/,wrt 6.1,T(5)
24: dsp "Loading Smooth Coeffs"
25: dim P(50);ldf T(5),P[*]
26: 3-r1;sto 29
27: dsp "Data for Smoothed Profile";wait 2000
28: ent "3=RAW,4=CORR",r1;if r1<3 or r1>4;jmp 0
29: dim S$(T(5)),W$(T(7));buf "SCAN",S$,4
30: dsp "loading SCAN data, file",T(1);ldf T(1),S$,W$
31: shf(1r(S$(1,2)),12)→r0
32: dsp "only",D$(r0-3),"is available";sto
33: if r0mod2=0;r0→P(46);jmp 3
34: dsp "select",r0-1,"=",D$(r0-4),",",r0,"=",D$(r0-3);sto
35: ent "ent selection",P(46)
36: for I=1 to I(5);if 'IFARR'(I,I(14))='IFARR'(I);1→Q(69)
37: next I
38: "SMOOTH NONLINEARITIES":
39: ent "Order of Curve Fit?";D;if D<1 or D>9;jmp 0
40: D+1-E;D+2-F;D-P(24)
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42: for L=1 to 2:cll 'SMOOTH'
43: for I=1 to E:MI[F]+P[I+10(L-1)+24]:next I:next L
44: fm 1:"SMOOTHED PROFILES CROSS SCAN":wrt 6.1
45: fm 1:"Order of T",10x,"Fwd",12x,"Rev":wrt 6.1:fm 1,f6.0,7x,2e15.7
46: for I=0 to D:wrt 6.1,I,P[I+25],P[I+35]:next I
47: fm 1,,"Warning: data used to generate coeffs: ",c8:wrt 6.1,D#[P[46]-3]
48: "SAVE COEFFICIENTS":0+r2
49: if P[1]=Q[1] and P[2]=Q[2]:eto "RECORD"
50: dsp "Incorrect Smooth Coeffs Data File":sto
51: eto "GO TO PART 2"
52: "RECORD":r2+1+r2:if r2=1:dsp "Insert Data Tape",Q#[37,42],"NOMINAL":sto
53: if r2=2:dsp "Insert Data Tape",Q#[37,42],"RESERVE":sto
54: dsp "recording smooth coeffs"
55: trk T[1]:for T[5],P[*]
56: if r2=1:eto "RECORD"
57: "GO TO PART 2":
58: dsp "insert tape AT":sto
59: tr 0:if 'MODE'=0:ldf 13
60: if 'MODE'=1:ldf 14
61: "SUBROUTINES":
62: "ANGA":asn((2(p1-C[11])+C[13])/r(4C[12]+2+C[13]+2))+p2
63: ret p2-atan(.5C[13]/C[12])
64: "ANGC":ret C[23]p1
65: "IFARA":10+4p2-3+p3:if p1#1:2itf(W#[2p1-3,2p1-2]+4p2-3+p3
66: cmpitf(S#[p3+3,p3+3])+p4:cmpitf(S#[p3,p3+1])+p5
67: ret 2+16sm(p5,12)+2shf(p4,1)+shf(shf(p4,-15),15)-C[14]
68: "IFARAF":2(itf(W#[2p1-1,2p1]+3)-61+p2:if p1=I[6]:p2+2+p2
69: cmpitf(S#[p2+2,p2+3])+p3:shf(shf(p3,-15),15)+2shf(p3,1)+p4
70: ret p4+2+16shf(cmpitf(S#[p2,p2+1]),12)-C[14]
71: "IFARC":10+4p2-3+p3:if p1#1:2itf(W#[2p1-3,2p1-2]+4p2-3+p3
72: ret shf(cmpitf(S#[p3,p3+1]),-5),5)-C[15]
73: "IFARCF":2(itf(W#[2p1-1,2p1]+3)-61+p2:if p1=I[6]:p2+2+p2
74: ret shf(shf(cmpitf(S#[p2,p2+1]),-5),5)-C[15]
75: "MODE":cll 'TELE'(1,2):ret bit(5,R)
76: "TELE":2itf(W#[2p1-1,2p1]-34+p6:if p1=I[6]:p6+2+p6
77: 0+p9:for M=2 to 5:if pM=0:jmp 4
78: pM+2(pMmod2)-1+p11:itf(S#[p6+p11-1,p6+p11])+p7:shf(shf(p7,-8),8)+p7
79: 0+p8:for L=0 to 7:p8+2+(7-L)bit(L,p7)+p8:next L:p8+R
80: 256p9+p8-p9:next M
81: if 256+(M-2)/2-1<p9:p9-256+(M-2)+p9
82: p9+P:p9/5.3064375+p10+T:ret p10
83: "TIMEF":2(itf(W#[2p1-1,2p1]+5)-61+p2:if p1=I[6]:p2+2+p2
84: cmpitf(S#[p2,p2+1])+p3:cmpitf(S#[p2+2,p2+3])+p4
85: 2shf(p4,1)+shf(shf(p4,-15),15)+2+16shf(shf(p3,-12),12)+p5
86: ret (p5-I[10])/Q[5]+I[11]
87: "SMOOTH":L+p1:if P[46]mod2=1:I[6]+L+p1
88: "ANGC"('IFARC'(1,1))+p3:if p1mod2=0:Q[4]+p3+p3
89: Q[4]/Q[6]+p4:(-1)^(L+1)p4+p4
90: for I=1 to E:for J=1 to F:0+M[I,J]:next J:next I
91: for K=1 to I[14]+1
92: if K=I[14] and Q[69]=1:eto "SkipSample"
93: dsp "Smoothing",L#[L]," Sample",K
94: "ANGC"('IFARC'(p1,K))+p5:(K-1)I[12]+p2
95: if K=I[14]+1:"ANGC"('IFARCF'(p1))+p5:"TIMEF"(p1)+p2
96: p5-p2p4-p3+p5
97: sfa 14:for I=1 to E
98: p2+(I-1)+p7:MI[F]+p6p7+M[I,F]
99: for J=1 to E:MI[I,J]+p2+(I+J-2)+M[I,J]:next J
100: next I:cfa 14
101: "SkipSample":next K
102: for I=1 to E:for J=1 to E:MI[I,J]+M[J,I]:next J:next I
103: "Inv":for I=1 to D:if M[I,I]#0:eto +5

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107: for K=1 to F:MEI,K]→pK:MEJ,K]→MEI,K]:pK→MEJ,K]:next K:to +3
108: next J
109: dsp "Singular matrix in Inv routine"
110: for J=1 to E
111: MEJ,I]→MEI,I]:U:for K=1 to F:MEJ,K]-MEI,K]U→MEJ,K]
112: next K:next J:next I:if M[E,E]=0:sto -3
113: for I=E to 1 by -1:if I=E:sto +2
114: for J=1 to E:MEI,F]-MEI,J]:J→J+MEI,F]:next J
115: MEI,F]-MEI,I]:pI→MEI,F]:next I:ret
#24932

0: wrt 6,"cross scan profile,2:tapeAT-FM,trlk0,file13,rev30281"
1: "PLOT SMOOTHED PROFILE--CROSS SCAN":
2: dsp "Load Data Sheet 4.3.4-4(p79)":sto
3: polr:wrt 725,"IP571,806,8177,10960"
4: scl 1.8,5-1.11:csiz 1.3,2:pen# 1
5: dsp "Align paper using Two Boxes"
6: plt 1.18,1.09,1:lbl ".":plt 7.46,10.12,1:lbl ".":plt 10,10,1:sto
7: dsp "Plotting":0→r1:1→r2:if I[8]>50:I[8]/50→r2
8: for I=1 to 2:for J=0 to I[8] by r2
9: max(abs('PROFILE'(I,1,J:I[2])),r1)→r1:next J:next I
10: 1e6r1-r1ernd(r1,1)→B:if r1>B:10→B→B
11: 5→B:scl -.09Q[6],1.16Q[6],-1.3226B,2.71B
12: fxd 0:ymax 0,.25Q[6],0,Q[6]:yax 0,.5B,-B,B,4
13: "MEASURED":for I=1 to 2
14: if I=1:pen# 4:line 1:plt .75Q[6],-.69B:plt .9Q[6],-.69B:pen
15: if I=2:pen# 2:line 5:plt .75Q[6],-.74B:plt .9Q[6],-.74B:pen
16: 'ANGC'('IFARC'(1,1))→r3:if Imod2=0:Q[4]+r3→r3
17: Q[4]/Q[6]→r4:(-1)↑(I+1)r4→r4
18: for J=1 to I[14]+1
19: if J=I[14] and Q[69]=1:sto "SkipSamp1"
20: (J-1)I[12]→r2:'ANGC'('IFARC'(I,J))→r5
21: if J=I[14]+1:'ANGC'('IFARCF'(I))→r5:'TIMEF'(I)→r2
22: r5-r2r4-r3→r6
23: if I=2:Q[6]-r2→r2
24: plt r2,1e6r6
25: "SkipSamp1":next J:pen:next I
26: "SMOOTHED":for K=1 to 2:K→I
27: if K=1:pen# 4:line 3:plt .75Q[6],-.6B:plt .9Q[6],-.6B:pen
28: if K=2:pen# 2:line 2,2:plt .75Q[6],-.65B:plt .9Q[6],-.65B:pen
29: 0→r0→r8:-1e10→M[1,K]:1e10→M[2,K]
30: 'ANGC'('IFARC'(1,1))→r3:if Imod2=0:Q[4]+r3→r3
31: Q[4]/Q[6]→r4:(-1)↑(K+1)r4→r4
32: for J=1 to I[14]+1:if J=I[14] and Q[69]=1:sto "SkipSamp2"
33: (J-1)I[12]→r2:'ANGC'('IFARC'(I,J))→r5
34: if J=I[14]+1:'ANGC'('IFARCF'(I))→r5:'TIMEF'(I)→r2
35: r5-r2r4-r3→r6
36: 1e6'PROFILE'(K,1,r2)→r7:max(M[1,K],r7)→M[1,K]:min(M[2,K],r7)→M[2,K]
37: if K=2:Q[6]-r2→r2
38: plt r2,r7:r0+(1e6r6-r7)↑2→r0:r8+1→r8
39: "SkipSamp2":next J:pen:r(r0/r8)→r(10-Kmod2):next K
40: "inflection pts":0→r14+r15
41: for I=1 to 2:'DERIV2'(I,1,0)→r16
42: for J=1 to I[14]:if J=I[8] and Q[69]=1:sto "SkipSamp3"
43: J:I[12]→r23:if J=I[14]:'TIMEF'(I)→r23
44: 'DERIV2'(I,1,r23)→r24:if r24#r16:r24+r16:r(15-Imod2)+1→r(15-Imod2)
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45: "SkipSamp3":next J:next I
46: "Label1":scl 1,8.5,1,1:pen# 1
47: fxd 1:plt 5.6,6.6,1:lbl r9:plt 6.65,6.6,1:lbl r10
48: plt 8,6.6,1:if r9<=2.6 and r10<=2.6:lbl "P":jmp 2
49: lbl "F"
50: fxd 0:plt 5.6,7.45,1:lbl r14:plt 6.65,7.45,1:lbl r15
51: plt 8,7.45,1:if r14<=3 and r15<=3:lbl "P":jmp 2
52: lbl "F"
53: if 'MODE'=0:plt 3.7,9.75,1:lbl "SAM MODE"
54: plt 2.1,9.55,1:lbl Q[1,32]
55: plt 4.6,9.55,1:lbl Q[33,35]
56: plt 6.7,9.55,1:lbl C[1]
57: plt 7,9.65,1:fxd 1:lbl Q[65], " ", Q[66], " ", Q[58]
58: plt 1,9,8,9,1:fxd 2:lbl 1e6Q[4], " urad"
59: for I=0 to D:plt 4,9,9-.25,1
60: fxd 0:lbl I:plt 4:lbl " ", P[I+25], " ", P[I+35]:next I
61: fxd 1:plt 5.6,7.08,1:lbl M[1,1]
62: plt 5.6,6.88,1:lbl M[2,1]
63: plt 6.65,7.08,1:lbl M[1,2]
64: plt 6.65,6.88,1:lbl M[2,2]
65: plt 8,7,1
66: for I=1 to 2:for J=1 to 2
67: if abs(M[I,1])>20:lbl "F":jmp 2
68: next J:next I:lbl "P"
69: plt 4.5,6.3,1:lbl Q[70], " TOPR PRESSURE"
70: plt 4.5,6.1,1:fxd 2:if P[46]=8 or P[46]=9:jmp 2
71: lbl "MIDSCAN PRESSURE CORRECTION: ", 'PRESS'Q[70], " URAD"
72: plt 5,2,1,1:lbl "data for smoothed profile: ", D[P[46]-3]
73: plt 5,1,9,1:lbl "data for measured profile: ":lbl D[P[46]-P[46]mod2-3]
74: plt 1.6,1.5,1:fxd 4:lbl Q[1]+Q[2]/1e4
75: plt 2,1,1,3,1:fxd 0:lbl Q[36,36], " ", Q[43,44], " sea ", Q[3]
76: plt 1.7,1.1,1:lbl "test no.", Q[43,44]
77: plt 6.8,1.6,1:lbl Q[1]:pen#
78: "PLOT NESTED AND NON-NESTED":
79: dsp "Load Data Sheet 4.3.4-5(p80)":sto
80: scl 1,8.5,1,1:csiz 1,3,2:pen# 1
81: dsp "Alien paper using two boxes"
82: plt 1.16, .75, 1:lbl ".":plt 7.47, 9.97, 1:lbl ".":plt 10, 10, 1:sto
83: dsp "Plotting":scl -.1033Q[6], 1.147Q[6], -1.573B, 2.46B
84: fxd 0:line :xax 0, .25Q[6], 0, Q[6]:yax 0, .5B, -B, B, 4
85: "MEASURED":for I=1 to 2
86: if I=1:pen# 4:line :plt .73Q[6], 1.2B:plt .85Q[6], 1.2B:pen
87: if I=2:pen# 2:line 5, 4:plt .73Q[6], 1.15B:plt .85Q[6], 1.15B:pen
88: 'ANGC'('IFARC'(1,1))+r3:if I mod 2=0:Q[4]+r3+r3
89: Q[4]/Q[6]+r4:(-1)^(I+1)r4+r4
90: for J=1 to I[14]+1
91: if J=I[14] and Q[69]=1:sto "SkipSamp3"
92: (J-1)I[12]+r2:'ANGC'('IFARC'(I,J))+r5
93: if J=I[14]+1:'ANGC'('IFARCF'(I))+r5:'TIMEF'(I)+r2
94: r5-r2r4-r3+r6
95: if I=2:Q[6]-r2+r2
96: plt r2, 1e6r5
97: "SkipSamp3":next J:pen:next I
98: "NESTED/NON-NESTED":0+r11:for I=1 to 2
99: if I=1:pen# 1:line 3:plt .73Q[6], 1.1B:plt .85Q[6], 1.1B:pen
100: if I=2:pen# 3:line :plt .73Q[6], 1.05B:plt .85Q[6], 1.05B:pen
101: 'ANGC'('IFARC'(1,1))+r3
102: Q[4]/Q[6]+r4
103: for J=1 to I[14]
104: (J-1)I[12]+r2:'ANGC'('IFARC'(1,J))+r5:'ANGC'('IFARC'(2, I[14]+1-J))+r7
105: r5-r2r4-r3+r6:r7-r2r4-r3+r8

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107: if I=2;if r11<abs(2r9)labs(2r9)+r11
108: next J:peninext I
109: "Label2":scl 1,8.5,1,11;pen# 1
110: plt 2.1,9.4,1;lbl Q#[1,32]
111: plt 4.6,9.4,1;lbl Q#[33,35]
112: plt 6.7,9.5,1;lbl C[1]
113: plt 5.2,9.1,1;fxd 1;lbl Q[65]," ",Q[65]," ",Q[58]
114: if 'MODE'=0;plt 3.9,9.5,1;lbl "SAM MODE"
115: plt 4.6,1.85,1;fxd 2;lbl r11
116: plt 6.7,1.85,1;if r11<=2.1;lbl "P";jmp 2
117: lbl "F"
118: plt 1.6,1.4,1;fxd 4;lbl Q[1]+Q[2]/1e4
119: plt 2.1,1.15,1;fxd 0;lbl Q#[36,36],"-",Q#[43,44]," sea ",Q[3]
120: plt 1.7,1,1;lbl "test no.",Q#[43,44]
121: plt 6.9,1.45,1;lbl Q[1]
122: plt 5.7,3,1;lbl "data for smoothed profile : ",D#[P[46]-3]
123: pen# 1;dsp "Finished";stp
124: "SUBROUTINES":
125: "ANGA":asn((2*(p1-C[11])+C[13])/r(4C[12]^2+C[13]^2))+p2
126: ret p2-atn(.5C[13]/C[12])
127: "ANGC":ret C[23]p1
128: "DERIV2":3+21p2+p4;p4+10((p1+1)mod2)+1+p5;0+p6;if P[p4]<3;jmp 2
129: for L=3 to P[p4];p6+L(L-1)P[L+p5]p3+(L-2)+p6;next L
130: ret sen(p6+2P[2+p5])
131: "IFARA":10+4p2-3+p3;if p1#1;2itf(W#[2p1-3,2p1-2])+4p2-3+p3
132: cmpitf(S#[p3+2,p3+3])+p4;cmpitf(S#[p3,p3+1])+p5
133: ret 2+16shf(p5,12)+2shf(p4,1)+shf(shf(p4,-15),15)-C[14]
134: "IFARAF":2(itf(W#[2p1-1,2p1])+3)-61+p2;if p1=I[6];p2+2+p2
135: cmpitf(S#[p2+2,p2+3])+p3;shf(shf(p3,-15),15)+2shf(p3,1)+p4
136: ret p4+2+16shf(cmpitf(S#[p2,p2+1]),12)-C[14]
137: "IFARC":10+4p2-3+p3;if p1#1;2itf(W#[2p1-3,2p1-2])+4p2-3+p3
138: ret shf(shf(cmpitf(S#[p3,p3+1]),-5),5)-C[15]
139: "IFARCF":2(itf(W#[2p1-1,2p1])+3)-61+p2;if p1=I[6];p2+2+p2
140: ret shf(shf(cmpitf(S#[p2,p2+1]),-5),5)-C[15]
141: "MODE":c11 'TELE'(1,2);ret bit(5,R)
142: "PROFILE":3+21p2+p4;p4+10((p1+1)mod2)+1+p5;0+p6;for L=1 to P[p4]
143: p6+P[p5+L]p3+L+p6;next L;ret p6+P[p5]
144: "TIMEF":2(itf(W#[2p1-1,2p1])+5)-61+p2;if p1=I[6];p2+2+p2
145: cmpitf(S#[p2,p2+1])+p3;cmpitf(S#[p2+2,p2+3])+p4
146: 2shf(p4,1)+shf(shf(p4,-15),15)+2+16shf(shf(p3,-12),12)+p5
147: ret (p5-I[10])/Q[5]+I[11]
148: "TELE":2itf(W#[2p1-1,2p1])-34+p6;if p1=I[6];p6+2+p6
149: 0+p9;for M=2 to 5;if pM=0;jmp 4
150: pM+2(pMmod2)-1+p11;itf(S#[p6+p11-1,p6+p11])+p7;shf(shf(p7,-8),8)+p7
151: 0+p8;for L=0 to 7;p8+2+(7-L)bit(L,p7)+p8;next L;p8+R
152: 256p9+p8+p9;next M
153: if 256+(M-2)/2-1<p9;p9-256+(M-2)+p9
154: p9+p9/5.3064375+p10+T;ret p10
13397

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fmt 1:"cross scan profile,3;tapeRT-FM,trk0,file14,rev22681"
wrt 6.1
"PLOT SMOOTHED PROFILE--CROSS SCAN":
dsp "Load Data Sheet 4.3.4-4(p79)";stp
pclriwrt 705,"IP571,806,8177,10960"
scl 1,8.5,1,11;csiz 1.3,2;pen# 1
dsp "Alien paper using Two Boxes"

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8: dsc "PlotLine":I0+r1:I1+r2;if I[81]>50;I[81]/50+r2
9: for I=1 to 2:for J=0 to I[81] by r2
10:  m:=abs('PROFILE'(I,1,J[I[12]]),r1)+r1;next J;next I
11: 1e6r1-r1:arnd(r1,1)+8;if r1>8;10+8+8
12: 5+8:sc1 -.090[61],1.160[61],-1.3398,2.7438
13: fxd 0:ax 0,.250[61],0,0[61];yax 0,.5B,-B,B,4
14: "MEASURED":for I=1 to 2
15: if I=1:pen# 4;line 3:plt .750[61],-.698;plt .90[61],-.698;pen
16: if I=2:pen# 2;line 5:plt .750[61],-.748;plt .90[61],-.748;pen
17: 'ANGC'('IFARC'(I,1))+r3;if Imod2=0;0[4]+r3+r3
18: 0[4]/0[61]+r4;(-1)^(I+1)r4+r4
19: for J=1 to I[14]+1
20: if J=I[14] and 0[69]=1;eto "SkipSamp1"
21: (J-1)I[12]+r2;'ANGC'('IFARC'(I,J))+r5
22: if J=I[14]+1;'ANGC'('IFARCF'(I))+r5;'TIMEF'(I)+r2
23: r5-r2r4-r3-r6
24: if I=2;0[61]-r2+r2
25: plt r2,1e6r6
26: "SkipSamp1":next J;pen;next I
27: "SMOOTHED":for K=1 to 2;K+1
28: if K=1:pen# 4;line 3:plt .750[61],-.6B;plt .90[61],-.6B;pen
29: if K=2:pen# 2;line 2,2:plt .750[61],-.658;plt .90[61],-.658;pen
30: 0-r3+r3:-1e10-n[1,K];1e10+M[2,K]
31: 'ANGC'('IFARC'(I,1))+r3;if Imod2=0;0[4]+r3+r3
32: 0[4]/0[61]+r4;(-1)^(K+1)r4+r4
33: for J=1 to I[14]+1;if J=I[14] and 0[69]=1;eto "SkipSamp2"
34: (J-1)I[12]+r2;'ANGC'('IFARC'(I,J))+r5
35: if J=I[14]+1;'ANGC'('IFARCF'(I))+r5;'TIMEF'(I)+r2
36: r5-r2r4-r3-r6
37: 1e6'PROFILE'(K,1,r2)+r7;max(M[1,K],r7)+M[1,K];min(M[2,K],r7)+M[2,K]
38: if K=2;0[61]-r2+r2
39: plt r2,r7;r0+(1e6r6-r7)^2+r0;r8+1+r8
40: "SkipSamp2":next J;pen;r(r0/r8)+r(10-Kmod2);next K
41: "Inflection pts":0+r14+r15
42: for I=1 to 2;'DERIV2'(I,1,0)+r16
43: for J=1 to I[14];if J=I[81] and 0[69]=1;eto "SkipSamp3"
44: J[I[12]+r23;if J=I[14];'TIMEF'(I)+r23
45: 'DERIV2'(I,1,r23)+r24;if r24#r16;r24+r16;r(15-Imod2)+1+r(15-Imod2)
46: "SkipSamp3":next J;next I
47: "Label1":sc1 1,8.5,1,1;pen# 1
48: fxd 1:plt 5.6,6.6,1;lbl r9;plt 6.65,6.6,1;lbl r10
49: plt 8,6.6,1;lbl "-"
50: fxd 0:plt 5.6,7.45,1;lbl r14;plt 6.65,7.45,1;lbl r15
51: plt 8,7.45,1;lbl "-"
52: if 'MODE'=1;plt 3.7,9.75,1;lbl "BUMPER MODE"
53: plt 2.1,9.55,1;lbl Q#[1,32]
54: plt 4.6,9.55,1;lbl Q#[33,35]
55: plt 6.7,9.55,1;lbl C[1]
56: plt 7,9.65,1;fxd 1;lbl Q[65],"",Q[66],"",Q[58]
57: plt 1,9,8.9,1;fxd 2;lbl 1e6Q[+1]," urad"
58: for I=0 to D:plt 4.9,9-.25I,1
59: fxd 0;lbl I;plt 4;lbl " ",P[I+25]," ",P[I+35];next I
60: fxd 1;plt 5.6,7.08,1;lbl M[1,1]
61: plt 5.6,6.88,1;lbl M[2,1]
62: plt 6.65,7.08,1;lbl M[1,2]
63: plt 6.65,6.88,1;lbl M[2,2]
64: plt 8,7,1;lbl "-"
65: plt 4.5,6.3,1;lbl Q[70]," TORR PRESSURE"
66: plt 4.5,6.1,1;fxd 2;if P[46]=8 or P[46]=9;jmp 2
67: lbl "MIDSCAN PRESSURE CORRECTION: ", 'PRESS'Q[70]," URAD"
68: plt 5.2,1,1;lbl "data for smoothed profile :",D#[P[46]-3]
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70: plt 1.6,1.5,1;fxd 4;lbl Q[1]+Q[2]/1e4
71: plt 2.1,1.3,1;fxd 0;lbl Q[36,36], "-", Q[43,44], " sea ", Q[3]
72: plt 1.7,1.1,1;lbl "test no.", Q[43,44]
73: plt 5.8,1.5,1;lbl Q[1];pen#
74: "PLOT NESTED AND NON-NESTED":
75: dsp "Load Data Sheet 4.3.4-5(p20)" ;stp
76: scl 1,8.5,1,1;csiz 1.3,2;pen# 1
77: dsp "Align paper using two boxes"
78: plt 1.16,1.76,1;lbl ". ";plt 7.47,9.97,1;lbl ". ";plt 10,10,1;stp
79: dsp "Plotting";scl -.1033Q[6],1.147Q[6],-1.587B,2.462B
80: fxd 0;line ;xax 0,.25Q[6];yax 0,.5B,-B,B,4
81: "MEASURED":for I=1 to 2
82: if I=1;pen# 4;line ;plt .73Q[6],1.2B;plt .85Q[6],1.2B;pen
83: if I=2;pen# 2;line 5,4;plt .73Q[6],1.15B;plt .85Q[6],1.15B;pen
84: 'ANGC'('IFARC'(1,1))>r3;if I mod 2=0;Q[4]+r3>r3
85: Q[4]/Q[6]+r4;(-1)^(I+1)r4>r4
86: for J=1 to I[14]+1
87: if J=I[14] and Q[69]=1;eto "SkipSamp3"
88: (J-1)I[12]+r2;'ANGC'('IFARC'(1,J))>r5
89: if J=I[14]+1;'ANGC'('IFARCF'(I))>r5;'TIMEF'(I)>r2
90: r5-r2r4-r3>r6
91: if I=2;Q[6]-r2>r2
92: plt r3,1e6r6
93: "SkipSamp3":next J;pen;next I
94: "NESTED/NON-NESTED":0>r11;for I=1 to 2
95: if I=1;pen# 1;line 3;plt .73Q[6],1.1B;plt .85Q[6],1.1B;pen
96: if I=2;pen# 3;line ;plt .73Q[6],1.05B;plt .85Q[6],1.05B;pen
97: 'ANGC'('IFARC'(1,1))>r3
98: Q[4]/Q[6]+r4
99: for J=1 to I[14]
100: (J-1)I[12]+r2;'ANGC'('IFARC'(1,J))>r5;'ANGC'('IFARC'(2,I[14]+1-J))>r7
101: r5-r2r4-r3>r6;r7-r2r4-r3>r8
102: 1e6(r6+(-1)^(I-1)r8)/2>r9;plt r2,r9
103: if I=2;if r11<abs(2r9);abs(2r9)+r11
104: next J;pen;next I
105: "Label2":scl 1,8.5,1,1;pen# 1
106: plt 2.1,9.4,1;lbl Q[1,32]
107: plt 4.6,9.4,1;lbl Q[33,35]
108: plt 6.7,9.5,1;lbl C[1]
109: plt 5.8,9.1,1;fxd 1;lbl Q[65], " ", Q[66], " ", Q[58]
110: if 'MODE'=1;plt 3.9,9.5,1;lbl "BUMPER MODE"
111: plt 4.6,1.85,1;fxd 2;lbl r11
112: plt 6.7,1.85,1;lbl "-"
113: plt 1.6,1.4,1;fxd 4;lbl Q[1]+Q[2]/1e4
114: plt 2.1,1.15,1;fxd 0;lbl Q[36,36], "-", Q[43,44], " sea ", Q[3]
115: plt 1.7,1,1;lbl "test no.", Q[43,44]
116: plt 6.9,1.45,1;lbl Q[1]
117: plt 5.7,3,1;lbl "data for smoothed profile :";D[P[46]-3]
118: pen# ;dsp "Finished";stp
119: "SUBROUTINES":
120: "ANGC":asn((2(p1-C[11])+C[13])/r(4C[12]+2+C[13]+2))>p2
121: ret p2-atn(.5C[13]/C[12])
122: "ANGC":ret C[23]p1
123: "DERIV2":3+21p2+p4;p4+10((p1+1) mod 2)+1>p5;0>p6;if P[p4]/3;jmp 2
124: for L=3 to P[p4];p6+L(L-1)P[L+p5]p3+(L-2)>p6;next L
125: ret asn(p6+2P[2+p5])
126: "IFARR":10+4p2-3>p3;if p1#1;2itf(W[2p1-3,2p1-2])+4p2-3>p3
127: cmpitf(S[p3+2,p3+3])>p4;cmpitf(S[p3,p3+1])>p5
128: ret 2+16shf(p5,12)+2shf(p4,1)+shf(shf(p4,-15),15)-C[14]
129: "IFARRF":20itf(W[2p1-1,2p1]+3)-61>p2;if p1=I[6];p2+2>p2
130: cmpitf(S[p2+2,p2+3])>p3;shf(shf(p3,-15),15)+2shf(p3,1)>p4
131: ret p4+2+16shf(cmpitf(S[p2,p2+1]),12)-C[14]

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132: "IFARC":10+4p2-3+p3;if p1#1;2itf(W$(2p1-3,2p1-2))+4p2-3+p3
133: ret shf(shf(cmpitf(S$(p3,p3+1)),-5),5)-C[15]
134: "IFARCF":2(itf(W$(2p1-1,2p1))+3)-61+p2;if p1=I[6];p2+2+p2
135: ret shf(shf(cmpitf(S$(p2,p2+1)),-5),5)-C[15]
136: "MODE":c11 'TELE'(1,2);ret bit(5,R)
137: "PROFILE":3+21p2+p4;p4+10((p1+1)mod2)+1+p5;0+p6;for L=1 to P[p4]
138: p6+P[p5-L]p3↑L+p6;next L;ret p6+P[p5]
139: "TIMEF":2(itf(W$(2p1-1,2p1))+5)-61+p2;if p1=I[6];p2+2+p2
140: cmpitf(S$(p2,p2+1))+p3;cmpitf(S$(p2+2,p2+3))+p4
141: 2shf(p4,1)+shf(shf(p4,-15),15)+2↑16shf(shf(p3,-12),12)+p5
142: ret (p5-I[10])/Q[5]+I[11]
143: "TELE":2itf(W$(2p1-1,2p1))-34+p6;if p1=I[6];p6+2+p6
144: 0+p9;for M=2 to 5;if pM=0;jmp 4
145: pM+2(pMmod2)-1+p11;itf(S$(p6+p11-1,p6+p11))+p7;shf(shf(p7,-8),8)+p7
146: 0+p8;for L=0 to 7;p8+2↑(7-L)bit(L,p7)+p8;next L;p8+R
147: 256p9+p8+p9;next M
148: if 256↑(M-2)/2-1<p9;p9-256↑(M-2)+p9
149: p9+P;p9/5.3064375+p10+T;ret p10
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TS 32015-004
Rev 3

DATA SHEET 5.2.1

TEST COMPUTER

PROGRAM LISTINGS

PROGRAM NAME:

SMA Designation F-1 S/N 4 TELEMETRY PRINTOUT
TAPE F-1 TRK 0 FILE 15.16 SHEET 1 OF 1

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0: f... 1. "TELEMETRY PRINTOUT, 1; tape AT-F, trk 0, file 15, rev 22381"
1: wrt 6.1; rod
2: dim D$[5,81]; "CORR" -> D$[1]; "CORR/AVG" -> D$[2]; "NORM" -> D$[3]; "NORM/AVG" -> D$[4]
3: "RAW" -> D$[5]; "RAW/AVG" -> D$[6]
4: dim Q[25]; IC[15]; QC[70]; Q$[50]; TC[10]
5: dsp "Insert Data Tape"; istp
6: ent "Track for Data"; r0
7: ent "File for INIT/CAL Data"; r1
8: dsp "Loading INIT/CAL Data"
9: trk r0; ldf 1; IC[*]; IC[*]; QC[*]; Q$; TC[*]
10: dsp "Loading Scan Data"
11: dim S$[TC[61], W$[TC[71]]]; buf "SCAN", S$, 4; ldf TC[3]; S$, W$
12: fnt 1, 1, "Date: ", f26.0, 5x; "Time: ", f24.0; wrt 6.1, Q[11], Q[31]
13: fnt 1, 1, "SMA Designation: ", 3x; 32ciwrt 6.1, Q$[1, 32]
14: fnt 1, "Serial Number: ", 5x; 3ciwrt 6.1, Q$[33, 35]
15: fnt 1, "Run Number: ", 7x; f11.4; wrt 6.1, Q[11] + Q[21] / 1e4
16: fnt 1, "Test Flow Event: ", 3x; 1ciwrt 6.1, Q$[36, 36]
17: fnt 1, "Test Number: ", 7x; 2ciwrt 6.1, Q$[43, 44]
18: fnt 1, "Sequence Number: ", f4.0; wrt 6.1, Q[3]
19: fnt 1, 1, "Data tape identifier: ", 14x; 6ciwrt 6.1, Q$[37, 42]
20: fnt 1, "Track for data: ", f21.0; wrt 6.1, TC[1]
21: fnt 1, "INIT/CAL data file number: ", f10.0; wrt 6.1, TC[2]
22: fnt 1, "SCAN data file number: ", f14.0; wrt 6.1, TC[3]
23: fnt 1, "NORM/AVG SCAN data file number: ", f5.0; wrt 6.1, TC[4]
24: fnt 1, "Smoothing Coeffs file number: ", f7.0, /; wrt 6.1, TC[5]
25: if IC[6] = IC[13]; 110 -> r0
26: if IC[6] # IC[13]; 111 -> r0
27: sto 30
28: dsp "ent mode (1=yes, 0=no)"; wait 2000
29: 111 -> r0; ent "ent mode [RAW/CORR/NORM/AVG]"; r0; if r0 < 100 or r0 > 100; 1
30: cll "CODES$"; (1e4r0 + r0); "btd" (r0) -> r0
31: fnt 1, "mode selected: ", c8; wrt 6.1, D$[r0-3]; wrt 6
32: dsp "insert AT tape"; istp
33: trk 0; ldf 16
34: "SUBROUTINES":
35: "btd"; p1 -> p2; 0 -> p4; for L=0 to 7; p2 mod 10 -> p3; if p3 > 1; ret 1e-10
36: p4 + p(3) * 2 -> L + p4; int (p2 / 10) -> p2; next L; ret p4
37: "CODES$"; "btd" (p1) -> p2; p(2) * 2 + p3; if p3 > 2 + 15 - 1; p3 - 2 + 16 -> p3
38: fti (p3) -> S$[1, 1]; ret p2
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0: (m: 1... 'TELEMETRY PRINTOUT,2; tapeAT-F, trk0, file16, rev22381"
1: wrt 6.1; rad
2: dim A$(1); B$(17,19); C$(2,7)
3: dim T$(3,5); U$(20,9)
4: -1-r40: 'GETS$'-A: 'GETS$'-A
5: if bit("x10xxxx",A); dsp "RAW SAM"; wait 3000
6: if bit("x00xxxx",A); dsp "FROC SAM"; wait 3000
7: "      1-SYNO      " ">B$(1)";      2 OPSTAT N      ">B$(2)
8: "      3 SCNLIN N      ">B$(3)";      4 5 TRNERR N      ">B$(4)
9: "      6 7 TORPLS N      ">B$(5)";      8 9 SHSERR N-1 ">B$(6)
10: "      10 11 FHSERR N-1 ">B$(7)"; 12 13 14 SUMERR N-1 ">B$(8)
11: "      15 16 SCNCTR      ">B$(9)";      17 SCNLIN N-1 ">B$(10)
12: "      18 19 TRNERR N-1 ">B$(11)";      20 21 TORPLS N-1 ">B$(12)
13: "      22 23 SHSERR N-2 ">B$(13)";      24 25 FHSERR N-2 ">B$(14)
14: "      26 27 28 SUMERR N-2 ">B$(15)"; 29 30 31 SCNTYM N-2 ">B$(16)
15: "      32 NSCANS      ">B$(17)
16: "Forward"-C$(1); "Reverse"-C$(2)
17: fnt 1,/, "Data Date: ",fz6.0,5x, "Data Time: ",fz4.0; wrt 6.1; C$(1),C$(2)
18: 'MODE'-r48; if r48=0; fnt 1,/, "SAM MODE operation"; wrt 6.1
19: if r48=1; fnt 1,/, "BUMPER MODE operation"; wrt 6.1
20: ent "No. of SCANS in DATA",S; S-II[6]
21: for I=1 to 2; jmp 2
22: "STAR": 1-2; for I=S-1 to S
23: fnt 1,/, "scan N: ",fz3.0,5x, "no. of words transferred =",fz5.0
24: if I=1; wrt 6.1; I; if (W$(2I-1,2I)); jmp 2
25: wrt 6.1; I; if (W$(2I-1,2I))-if (W$(2I-3,2I-2))
26: fnt 1,/, "Line Length, N-1: ",7x,fz3.0,1x,fz3.0,1x,fz3.0,1x,fz3.0
27: for J=1 to 4; cll 'LINE'(I,J,1); R+r(40+J); next J
28: wrt 6.1; dtor41; dtor42; dtor43; dtor44
29: 'LINE'(I,2,5,1.5)+r45; 'LINE'(I,1,1.5)+r46
30: if r48=0; 60743-r45-r46+r47; fnt 1, "Active Scan Time, N-1: ",fz10.2
31: if r48=1; 'LINE'(I,1,3,1)+r47; fnt 1, "Bumper to Bumper Time, N-1: ",fz12.1
32: wrt 6.1; r47
33: fnt 1, "Final Time, N: ",fz18.2; wrt 6.1; 1e6 'TIMEF'(I)
34: fnt 1,/, "TELEMETRY"; wrt 6.1
35: fnt 1,1x, "Byte No",3x, "Name",7x, "Contents",5x, "Pulses Time(usec)"
36: wrt 6.1
37: fnt 1,c19,2x,fz3.0,8x,fz9.0,2fz10.2
38: fnt 2,c19,2x,fz3.0,1x,fz3.0,4x,fz9.0,2fz10.2
39: fnt 3,c19,2x,fz3.0,1x,fz3.0,1x,fz3.0,fz9.0,2fz10.2
40: fnt 4,c19,2x,fz3.0,10x, "Bit 7 =",fz2.0,": Scan N=",c7
41: fnt 5,c19,2x,fz3.0,10x, "No. Scans =",fz5.0, " (decimal)"
42: for J=1 to 32; cll 'TELE'(I,J); R+r(J); next J
43: wrt 6.1; B$(1); dtor1
44: wrt 6.4; B$(2); dtor2; bit(7,r2); C$(bit(7,r2)+1)
45: cll 'TELE'(I,3)
46: wrt 6.1; B$(3); dtor3; P,T
47: cll 'TELE'(I,4,5)
48: wrt 6.2; B$(4); dtor4; dtor5; P,T
49: cll 'TELE'(I,6,7)
50: wrt 6.2; B$(5); dtor6; dtor7; P,T
51: cll 'TELE'(I,8,9)
52: wrt 6.2; B$(6); dtor8; dtor9; P,T
53: cll 'TELE'(I,10,11)
54: wrt 6.2; B$(7); dtor10; dtor11; P,T
55: cll 'TELE'(I,12,13,14)
56: wrt 6.3; B$(8); dtor12; dtor13; dtor14; P,T
57: cll 'TELE'(I,15,16)
58: wrt 6.2; B$(9); dtor15; dtor16
59: cll 'TELE'(I,17)
60: wrt 6.1; B$(10); dtor17; P,T

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61: call 'TELE'(1,18,19)
62: wrt 6.2,B#111,dtor18,dtor19,P,T
63: call 'TELE'(1,20,21)
64: wrt 6.2,B#112,dtor20,dtor21,P,T
65: call 'TELE'(1,22,23)
66: wrt 6.2,B#113,dtor22,dtor23,P,T
67: call 'TELE'(1,24,25)
68: wrt 6.2,B#114,dtor24,dtor25,P,T
69: call 'TELE'(1,26,27,28)
70: wrt 6.3,B#115,dtor26,dtor27,dtor28,P,T
71: call 'TELE'(1,29,30,31)
72: wrt 6.3,B#116,dtor29,dtor30,dtor31,P,T
73: wrt 6.5,B#117,dtor32,r32
74: next I
75: ato +1; if Z=0; ato "STAR"
76: dsp "inlined" ifmt 1; /wrt 6.1; end
77: "SUBROUTINES":
78: "dto":ret 1e4dtoint(p1/8+4)+dto(p1mod8+4)
79: "GET32":r40+2+r40;ret cmpitf(S#[r40,r40+1])
80: "LINE":2itf(W#[2p1-1,2p1])-60+p7;if p1=I[6];p7+2+p7
81: 0+p10;for M=0 to p3-.5 by .5
82: p2=M+p5;int(p5)+p6
83: p6-2;p6mod2-1+p12;8(p5mod1)+p13
84: 1+184(p7+p12-1,p7+p12)+p8;shf(shf(p8,-8),8)+p8
85: 0+p9;for L=0 to 3;p9+2+(3-L)bit(L+p13,p8)+p9;next L
86: 18p10+p9-p10;next M;p10+R;if p4=1;jmp 2
87: if 16(p3/.5)/2-1<p10;p10-16+(p3/.5)+p10
88: p10-P;p10/5.3064375+p11;ret p11
89: "MODE":call 'TELE'(1,2);ret bit(5,R)
90: "TELE":2itf(W#[2p1-1,2p1])-34+p6;if p1=I[6];p6+2+p6
91: 0+p9;for M=2 to 5;if pM=0;jmp 4
92: pM+2(pMmod2)-1+p11;itf(S#[p6+p11-1,p6+p11]+p7;shf(shf(p7,-8),8)+p7
93: 0+p8;for L=0 to 7;p8+2+(7-L)bit(L,p7)+p8;next L;p8+R
94: 256p9+p8+p9;next M
95: if 256+(M-2)/2-1<p9;p9-256+(M-2)+p9
96: p9+P;p9/5.3064375+p10+T;ret p10
97: "TIMEF":2(itf(W#[2p1-1,2p1])+5)-61+p2;if p1=I[6];p2+2+p2
98: cmpitf(S#[p2,p2+1])+p3;cmpitf(S#[p2+2,p2+3])+p4
99: 2shf(p4,1)+shf(shf(p4,-15),15)+2+16shf(shf(p3,-12),12)+p5
100: ret (p5-I[10])/Q[5]+I[11]
4918

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TS 32015-004
Rev B

DATA SHEET 5.2.1

TEST COMPUTER

PROGRAM LISTINGS

SMA Designation F-1 S/N Y PROGRAM NAME: Cross scan Repeatability
TAPE F-1 TRK 0 FILE 20.21 SHEET 1 OF 1

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0: fnt 1: "cross scan repeatability, 1; tape AT-FM, trk 0, file 20, rev 121880"
1: wrt 6.1; rad
2: dim K$[2,3]; "FWD" + K$[1]; "REV" + K$[2]
3: dim D$[6,8]; "CORR" + D$[1]; "CORR/AVG" + D$[2]; "NORM" + D$[3]; "NORM/AVG" + D$[4]
4: "RAW" + D$[5]; "RAW/AVG" + D$[6]
5: dim C[25]; I[15]; Q[70]; Q$[50]; TC[10]; PC[50]; DC[12]
6: dsp "insert data tape of previous TFE"; istp
7: ent "Trk for INIT/CAL data"; r0
8: ent "file for INIT/CAL data"; r1
9: dsp "Loading Init/Cal Data"
10: trk r0; ldf r1, C[*], I[*], Q[*], Q$, TC[*]; Q[4] + r13
11: if I[6]#I[13]; dsp "data set is not scan profile"; end
12: dsp "Loading Smooth Coeffs"; ldf TC[5]; PC[*]
13: fnt 1: "smoothing coefficients-CROSS SCAN"; wrt 6.1
14: fnt 1: "coeffs date: ", fz6.0, 5x, "coeffs time: ", fz4.0; wrt 6.1, PC[1], PC[2]
15: fnt 1: "order", 8x, "forward", 8x, "reverse"; wrt 6.1
16: fnt 1: fz5.0, 5x, 2e15.7; for I=0 to PC[24]; wrt 6.1, I, PC[1+25], PC[1+35]; next
17: if PC[46]=0; dsp "smooth coeffs have not computed"; end
18: fnt 1: "data used to generate smoothed coeffs : ", c8; wrt 6.1, D$[PC[46]]
19: dsp "Insert Data Tape"; istp
20: ent "Track for Data?"; r0
21: ent "File for Init/Cal Data?"; r1
22: dsp "Loading Init/Cal Data"
23: trk r0; ldf r1, C[*], I[*], Q[*], Q$, TC[*]
24: fnt 1: "Data Date: ", fz6.0, 5x, "Data Time: ", fz4.0; wrt 6.1, Q[11], Q[2]
25: fnt 1: "SMA Designation: ", 3x, 32c; wrt 6.1, Q$[1,32]
26: fnt 1: "Serial Number: ", 5x, 3c; wrt 6.1, Q$[33,35]
27: fnt 1: "Run Number: ", 7x, f11.4; wrt 6.1, Q[1]+Q[2]/1e4
28: fnt 1: "Test Flow Event: ", 3x, 1c; wrt 6.1, Q$[36,36]
29: fnt 1: "Sequence Number: ", fz4.0; wrt 6.1, Q[3]
30: fnt 1: "Data Tape Identifier: ", 14x, 6c; wrt 6.1, Q$[37,42]
31: fnt 1: "Track for Data: ", fz21.0; wrt 6.1, TC[1]
32: fnt 1: "Init/Cal Data File Number: ", fz10.0; wrt 6.1, TC[2]
33: fnt 1: "Scan Data File Number: ", fz14.0; wrt 6.1, TC[3]
34: fnt 1: "Norm/Avg Scan Data File Number: ", fz5.0; wrt 6.1, TC[4]
35: dim S$[TC[6]], W$[TC[7]]; buf "SCAN", S$, 4; trk TC[1]
36: 4-r1; goto 39
37: dsp "Data for Computation"; wait 2000
38: ent "3=RAW, 4=CORR", r1; if r1<3 or r1>4; jmp 0
39: dsp "loading SCAN data, file", TC[r1]; ldf TC[r1], S$, W$
40: shf(itf(S$[1,21], 12) + r0
41: dsp "only", D$[r0-3], "is available"; istp

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42: r0-r0mod2+r0;dsp D$(r0-3),"is selected";stp
43: fmt 1;"DATA USED FOR COMPUTATIONS = ";8c;wrt 6.1,D$(r0-3);wrt 6
44: for I=1 to I[6];if 'IFARA'(I,I[14])='IFARAF'(I);I+Q[69]
45: next I
46: "max RMS & corresp MEAN":
47: 0+D[7]-D[8];int(I[6]/2+.5)-1+D[1];int(I[6]/2)+D[2]
48: for J=1 to I[14]+1;if J=I[14] and Q[69]=1;sto "SkipSample"
49: 0+r7+r8+r9+r10
50: for I=1 to I[6]-1;Imod2+r15;dsp "sample",J," scan",I
51: 'ANGC'('IFARC'(I[6]+1,1))+r3;if Imod2=0;r13+r3+r3
52: r13/Q[6]+r4;(-1)^(I+1)r4+r4
53: (J-1)I[12]+r2;'ANGC'('IFARC'(I,J))+r5
54: if J=I[14]+1;'TIMEF'(I)+r2;'ANGC'('IFARCF'(I))+r5
55: r5-r2r4-r3+r6;r6-'PROFILE'(r15,1,r2)+r18
56: r(8-r15)+r18+r(8-r15);r(10-r15)+r18+2+r(10-r15);next I
57: for K=1 to 2
58: r(r(10-Kmod2)/D[K])+r19;if abs(r19)<abs(D[K+8]);jmp 2
59: r19+D[K+8];J+D[K+2];r(8-Kmod2)/D[K]+D[K+4]
60: next K
61: "SkipSample":next J
62: "SIGMA":0+r11+r12;for I=1 to I[6]-1;Imod2+r15;4-r15+r1
63: 'ANGC'('IFARC'(I[6]+1,1))+r3;if Imod2=0;r13+r3+r3
64: r13/Q[6]+r4;(-1)^(I+1)r4+r4
65: (D[r1]-1)I[12]+r2;'ANGC'('IFARC'(I,D[r1]))+r5
66: if D[r1]=I[14]+1;'TIMEF'(I)+r2;'ANGC'('IFARCF'(I))+r5
67: r2+D[12]-r15;r5-r2r4-r3+r6
68: (r6-'PROFILE'(r15,1,r2)-D[6-r15])+2+r(12-r15)+r(12-r15)
69: next I;r(r11/(D[1]-1))+D[7];r(r12/(D[2]-1))+D[8]
70: fmt 1,/, "repeatability based on",c8, "worst case of RMS dev"
71: fmt 2,12x, "no.scans",16x, "time",6x, "mean",5x, "sigma",7x, "RMS"
72: wrt 6.1,D$(r0-3);wrt 6.2
73: fmt 1,5x,c3,f12.0,f20.0,3f10.2
74: for K=1 to 2
75: wrt 6.1,K$(K),D[K],1e6D[K+10],1e6D[K+4],1e6D[K+6],1e6D[K+8];next K
76: dsp "load tape AT";stp
77: trk 0;ldf 21
78: "SUBROUTINES":
79: "ANGC":ret CC[23]p1
80: "IFARA":10+4p2-3+p3;if p1#1;2itf(W$(2p1-3,2p1-2))+4p2-3+p3
81: cmpitf(S$(p3+2,p3+3))+p4;cmpitf(S$(p3,p3+1))+p5
82: ret 2+16shf(p5,12)+2shf(p4,1)+shf(shf(p4,-15),15)-C[14]
83: "IFARAF":2(itf(W$(2p1-1,2p1))+3)-61+p2;if p1=I[6];p2+2+p2
84: cmpitf(S$(p2+2,p2+3))+p3;shf(shf(p3,-15),15)+2shf(p3,1)+p4
85: ret p4+2+16shf(cmpitf(S$(p2,p2+1)),12)-C[14]
86: "IFARC":10+4p2-3+p3;if p1#1;2itf(W$(2p1-3,2p1-2))+4p2-3+p3
87: ret shf(shf(cmpitf(S$(p3,p3+1)),5),5)-C[15]
88: "IFARCF":2(itf(W$(2p1-1,2p1))+3)-61+p2;if p1=I[6];p2+2+p2
89: ret shf(shf(cmpitf(S$(p2,p2+1)),5),5)-C[15]
90: "PROFILE":3+21p2+p4;p4+10((p1+1)mod2)+1+p5;0+p6;for L=1 to P[p4]
91: p6+P[p5+L]p3+L+p6;next L;ret p6+P[p5]
92: "TIMEF":2(itf(W$(2p1-1,2p1))+5)-61+p2;if p1=I[6];p2+2+p2
93: cmpitf(S$(p2,p2+1))+p3;cmpitf(S$(p2+2,p2+3))+p4
94: 2shf(p4,1)+shf(shf(p4,-15),15)+2+16shf(shf(p3,-12),12)+p5
95: ret (p5-I[10])/Q[5]+I[11]
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0: fnt 1:"cross scan repeatability,2:tapeAT-FM,trlk0,file21,rev22681"
1: wrt 5.1
2: "PLOT CROSS SCAN REPEATABILITY":
3: dsp "Load Data Sheet 4.3.5-4(p84)"!stp
4: pcd:rwt 705,"IP571,806,8177,10960"
5: scl 1,8.5,1,11;csiz 1.3,2;pen# 1
6: dsp "Alien paper using Two Boxes"
7: plt 1.15,96,1;lbl ".":plt 7.48,10.04,1;lbl ".":plt 10,10,1;stp
8: dsp "Plotline":0+r1;1+r2;if I[8]>50;I[8]/50+r2
9: for I=1 to 2;for J=0 to I[8] by r2
10: max(abs('PROFILE'(I,1,(J-1)I[12])),r1)+r1;next J;next I
11: 1e6r1+r1*rnd(r1,1)+6;if r1>8;10+8+8
12: 5+6;scl -.09833Q[6],1.152Q[6],-1.6138,2.419B
13: fxd 0;fax 0,.25Q[6],0,Q[6];yax 0,.58,-8,8,4
14: "MEASURED/AVG":for K=1 to 2;I[6]+K+1
15: if K=1;pen# 1;line 1;plt .62Q[6],1.148;plt .75Q[6],1.148;pen
16: if K=2;pen# 2;line 5;4;plt .62Q[6],1.098;plt .75Q[6],1.098;pen
17: 'ANGC'('IFARC'(I[6]+1,1))+r3;if Kmod2=0;r13+r3+r3
18: r13/Q[6]+r4;(-1)^(K+1)r4+r4
19: for J=1 to I[14]+1
20: if J=I[14] and Q[69]=1;sto "SkipSame"
21: (J-1)I[12]+r2;'ANGC'('IFARC'(I,J))+r5
22: if J=I[14]+1;'TIMEF'(I)+r2;'ANGC'('IFARCF'(I))+r5
23: r5-r2+r3+r5
24: if K=2;Q[6]-r2+r2
25: plt r2,1e6r6
26: "SkipSame":next J;pen;next K
27: "SMOOTHED":for I=1 to 2
28: if I=1;pen# 4;line 3;4;plt .63Q[6],1.27B;plt .75Q[6],1.27B;pen
29: if I=2;pen# 2;line 2;2;plt .63Q[6],1.18B;plt .75Q[6],1.18B;pen
30: for J=1 to I[14]+1
31: (J-1)I[12]+r2;if J=I[14]+1;'TIMEF'(I)+r2
32: 1e6'PROFILE'(I,1,r2)+r7
33: if I=2;Q[6]-r2+r2
34: plt r2,r7
35: next J;pen;next I
36: "Label1":scl 1,8.5,1,11;pen# 1
37: fxd 2;for K=1 to 2;plt 4.3,3-.3K,1
38: lbl 1e6D[K+10], " ",1e6D[K+4], " ",1e6D[K+6], " ",1e6D[K+8]
39: next K
40: plt 7.7,2.6,1;if 1e6D[9]<1.55 and 1e6D[10]<1.55;lbl "P";jmp 2.
41: lbl "F"
42: plt 2.1,9.5,1;lbl Q#[1,32]
43: plt 3.5,9.5,1;lbl Q#[33,35]
44: fxd 0;plt 5.3,9.5,1;lbl C[1]
45: plt 6.4,9.2,1;fxd 1;lbl Q[65], " ",Q[66], " ",Q[58]
46: if 'MODE'=0;plt 3.9,9.6,1;lbl "SAM MODE"
47: plt 2.1,8.7,1;fxd 2;lbl 1e6r13, " urad"
48: csiz 1,2;plt 6.8,8,1;fxd 4;lbl P[1]+P[2]/1e4;csiz 1.3,2
49: plt 5.7,4,1;lbl "data for smoothed profile :";D#[P[46]-3]
50: plt 5.7,2,1;lbl "data for measured/avg profile :";lbl D#[r0+1-3]
51: plt 4.5,2,1;plt 3;lbl Q[70]
52: plt 1.6,1.5,1;fxd 4;lbl Q[1]+Q[2]/1e4
53: plt 2.1,1.3,1;fxd 0;lbl Q#[36,36], "-",Q#[43,44], " seq ",Q[3]
54: plt 1.7,1.1,1;lbl "test no.":Q#[43,44]
55: plt 6.8,1.6,1;lbl Q[1];pen#
56: dsp "finished";end
57: "SUBROUTINES":
58: "ANGC":ret C[23]p1
59: "IFARA":10+4p2-3+p3;if p1#1;2itf(W#[2p1-3,2p1-2])+4p2-3+p3
60: cmpitf(S#[p3+2,p3+3])+p4;cmpitf(S#[p3,p3+1])+p5
61: ret 2+16shf(p5,12)+2shf(p4,1)+shf(shf(p4,-15),15)-C[14]
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62: "IFARAF":2(itf(W#[2p1-1,2p1])+3)-61+p2;if p1=I[6];p2+2+p2
63: cmpitf(S#[p2+2,p2+3])+p3;shf(shf(p3,-15),15)+2shf(p3,1)+p4
64: p4+2*16shf(cmpitf(S#[p2,p2+1]),12)-C[14]
65: "IFARCF":.0+4p2-3+p3;if p1#1;2itf(W#[2p1-3,2p1-2])+4p2-3+p3
66: ret shf(shf(cmpitf(S#[p3,p3+1]),-5),5)-C[15]
67: "IFARCF":2(itf(W#[2p1-1,2p1])+3)-61+p2;if p1=I[6];p2+2+p2
68: ret shf(shf(cmpitf(S#[p2,p2+1]),-5),5)-C[15]
69: "PROFILE":3+21p2+p4;p4+10((p1+1)mod2)+1+p5;0+p6;for L=1 to P[p4]
70: p6+P[p5+L]p3+L+p6;next L;ret p6+P[p5]
71: "TIMEF":2(itf(W#[2p1-1,2p1])+5)-61+p2;if p1=I[6];p2+2+p2
72: cmpitf(S#[p2,p2+1])+p3;cmpitf(S#[p2+2,p2+3])+p4
73: 2shf(p4,1)+shf(shf(p4,-15),15)+2*16shf(shf(p3,-12),12)+p5
74: ret (p5-I[10])/C[5]+I[11]
75: "MODE":c11 'TELE'(1,2);ret bit(5,R)
76: "TELE":2(itf(W#[2p1-1,2p1])-34+p6;if p1=I[6];p6+2+p6
77: 0+p9;for M=2 to 5;if pM=0;jmp 4
78: pM+2(pMmod2)-1+p11;itf(S#[p6+p11-1,p6+p11])+p7;shf(shf(p7,-8),8)+p7
79: 0+p8;for L=0 to 7;p8+2*(7-L)bit(L,p7)+p8;next L;p8+R
80: 255p9-p8-p9;next M
81: if 256*(M-2)/2-1<p9;p9-256*(M-2)+p9
82: p9+P[p9/5.3964375+p10];T;ret p10
+3013

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TEST COMPUTER

PROGRAM NAME:

SPA Designation F-1 S/N 4 400 DATA collector
TAPE F-1 TRK 1 FILE 4-5-6 SHEET 1 OF 1

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00: rmt 1;"400data collection;1:tapeAT-FM,trlk1,file4,rev121980"
01: dsp "for OPERATIONAL PERFORMANCE only";stp
02: wrt 6.1;buf "INIT",5,4;buf "CAL",4,2;buf "DUMMY",3,2;rad
03: dim Q[25];I[15];Q[70];Q#[50];T[10]
04: d1:=34[3,4];Z[2];M[6];1.0612875e7+Q[5];6.0743e-2+Q[6]
05: d2:=I[2,5];U#[20,9]
06: dsp "Scanning Temperatures & Voltages"
07: 14.12+13*5.11+Q[31];13.31+Q[39];14.31+Q[40]
08: Des C"-T#[1]
09: "SMA -Z "++U#[5];"MF(-Z-X) "+U#[13];"MF(+Z-X) "+U#[14]
10: fmt 1,/, "Temperatures and Voltages";wrt 6.1
11: fmt 1, " Ch",3x,"Scanner Out",5x,"Device",6x,"Cal",9x,"Measurement"
12: wrt 6.1;fmt 1,f5.0,3x,e11.4,5x,c9,f5.0,f16.3,1x,c5
13: fmt 2,f5.0,3x,e11.4,5x,c9,f5.0, " ERROR";fmt 9,fz2.0;rem 722
14: for I=1 to 3;13+J;if I<3;12+J;if I<2;4+J
15: wrt 722,"F4R7T1M3A1H1"
16: wrt 709.9,J
17: red 722,Q[J+7]
18: 9999.999+Q[J+47];int(10frc(Q[J+27]))+r2
19: if r2<1 or r2>5;dsp "Error: Calibration =",r2;end
20: int(Q[J+27])+r27;if r27<1 or r27>20;dsp "Error: Device =",r27;end
21: 1+r29;if Q[J+7]>1e6;-9999.999+Q[J+7];sto "Error"
22: if r2=3;sto "SEN3"
23: "CUR1":7167.9+r3;5700+r4;4564.7+r5;3680.1+r6;2985.8+r7;2437.2+r8;2001+
24: 1652.1+r10;1373+r11;1146+r12;901.5+r13;809.5+r14
25: -5+r15;0+r16;3+r17;10+r18;15+r19;20+r20;25+r21;30+r22
26: 35+r23;40+r24;45+r25;50+r26
27: if Q[J+7]>r3;sto "Error"
28: for K=4 to 14;if Q[J+7]<rK;jmp 2
29: (r(K+12)-r(K+11))(Q[J+7]-r(K-1))/r(K-r(K-1))+r(K+11)+Q[J+47];sto,"Pri
30: next K;sto "Error"
31: "SEN3":(Q[J+7]-12175)/-127.096+Q[J+47];sto "Print"
32: "Print":wrt 6.1,J,Q[J+7],U#[r27],r2,Q[J+47],T#[r28];jmp 2
33: "Error":wrt 6.2,J,Q[J+7],U#[r27],r2
34: next I;wrt 6
35: dsp "check temperatures in printout";stp
36: fxd 3;dsp "temp diff =",Q[59]-Q[60],"deg C";stp
37: 2+12+Q[14];2+10+2+6+Q[15];10+Z[1];3+Z[2];0+r1+r4
38: "P0P5"+D#[1];"P1P4"+D#[2];"P2P3"+D#[3]
39: "Clock":red 717,r0;int(1e4frc(r0+1e-6))+Q[2];100int(r0+1e-6)+81+Q[1]
40: fmt 1,/, "Date: ",fz6.0,5x,"Time: ",fz4.0;wrt 6.1,Q[1],Q[2]

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16: ent "Serial Number(3 char max)",Q#[33,35]
17: ent "Test Flow Event(1 char max)",Q#[36,42]
18: ent "Test Number(2 char max)",Q#[43,44]
19: ent "Sequence Number",Q[3]
20: ent "ent PRESSURE in TORR",Q[70]
21: fnt 1,"SMA Designation:",3x,32ciwrt 6.1,Q#[1,32]
22: fnt 1,"Serial Number:",5x,3ciwrt 6.1,Q#[33,35]
23: fnt 1,"Run Number:",f18.4iwrt 6.1,Q[1]+Q[2]/1e4
24: fnt 1,"Test Flow Event:",3x,1ciwrt 6.1,Q#[36,36]
25: fnt 1,"Test Number:",7x,2ciwrt 6.1,Q#[43,44]
26: fnt 1,"Sequence Number:",f4.0iwrt 6.1,Q[3]
27: fnt 1,"pressure: ",8x,e9.2," TORR"iwrt 6.1,Q[70]
28: "SELECT MODE":
29: ent "Enter 1(Init),2(Cal),or 3(Scan)",r14
30: if r14=2:goto "CALIBRATE"
31: if r14=3:goto "SCAN"
32: "INITIALIZE":
33: dsp "Preset SCAN COUNT to 7157(oct)"istp
34: dsp "Preset TIME COUNT to 0"istp
35: dsp "SAM LOCK OFF, Start Mirror Scan"istp
36: 0+Cibuf "INIT"isdsp "press INITIALIZE on DAS"
37: tfr 8,"INIT"isdsp "Transferring Data"
38: rds("INIT")+C;if C=-1:jmp 0
39: dsp "ifmt 1,"INITIALIZE",13x,"Words Transferred:",f4.0iwrt 6.1,C
40: fnt 1,"Word Number 0: INTERRUPT",10x,"(Raw ",fz6.0," Octal)"
41: cmprdb("INIT")+A+I[1]
42: wrt 6.1,dtorA:fnt 3,5x,"Bit",5x,"Description",5x,"Setting"iwrt 6.3
43: fnt 2,5x,f2.0,c20,f4.0iwrt 6.2,0,"Panel Mode",bit(0,A)
44: wrt 6.2,1,"Calibrate Mode",bit(1,A)
45: wrt 6.2,2,"Scan Mode",bit(2,A)
46: cmprdb("INIT")+A+I[2]
47: fnt 1,"Word Number 1: PANEL STATUS",10x,"(Raw ",fz6.0," Octal)"
48: wrt 6.1,dtorA
49: wrt 6.3iwrt 6.2,0,"Bumper SW On",bit(0,A)
50: wrt 6.2,1,"Bee SAM P0/P3",bit(1,A)
51: wrt 6.2,2,"Bee SAM P2/P5",bit(2,A)
52: wrt 6.2,3,"Bee SAM PA/PB",bit(3,A)
53: wrt 6.2,45,"Processed SAM",bit("xx00xxxx",A)
54: wrt 6.2,45,"Raw SAM",bit("xx10xxxx",A)
55: wrt 6.2,45,"SAM 1 or SAM 2",bit("xx01xxxx",A)
56: wrt 6.2,45,"SAM 3 (CAL SAM)",bit("xx11xxxx",A)
57: wrt 6.2,6,"Single Reset",bit(6,A)
58: wrt 6.2,7,"End SAM P0/P3",bit(7,A)
59: wrt 6.2,8,"End SAM P2/P5",bit(8,A)
60: wrt 6.2,9,"End SAM PD/PE",bit(9,A)
61: wrt 6.2,10,"Ext Reset",bit(10,A)
62: wrt 6.2,11,"5 Facet",bit(11,A)
63: wrt 6.2,12,"Calibrate Mode",bit(12,A)
64: wrt 6.2,13,"Scan Mode",bit(13,A)
65: wrt 6.2,14,"Initialize Mode",bit(14,A)
66: wrt 6.2,15,"Slow Telemetry Mode",bit(15,A)
67: cmprdb("INIT")+A+I[3];cmprdb("INIT")+B+I[4]
68: fnt 1,"Word Numbers 2 and 3:",10x,"(Raw ",fz6.0,3x,fz6.0," Octal)"
69: wrt 6.1,dtorA:dtorB
70: shf(shf(B,-4),4)+r2;2+12-r2-1+I[6];dtor2+I[5]
71: 100dtoshf(A,2)+dto(shf(B,12)+shf(shf(A,-14),10))+I[7]
72: 2+15shf(A,1)+2+4shf(shf(A,-15),15)+shf(B,12)+I[10]
73: (2+20-I[10])/Q[5]+I[12]
74: int(Q[6]/I[12]+.1)+I[8];I[8]I[12]+I[11]
75: fnt 3,5x,"Scan Count Preset: ",fz4.0," Octal",5x,"No. of Scans:",f9.1
76: wrt 6.3,I[5],I[6]

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103: fmt 3.5: "Time Count Preset: ",fz7.0,11x,"No. of Samples:",f7.0
104: wrt 6.2,I[7],I[8]
105: if I[6]#400 or I[8]#0:eto "INITIALIZE"
106: I[6]#I[13]
107: I[8]#I[14]:I[13]I[8]#I[9]
108: 2(I[13](2I[14]+17)+5)+16+T[6]:2I[13]+T[7]
109: fmt 1.:/ "Number of Scans of S$ Dimension:",f5.0:wrt 6.1,I[13]
110: fmt 1: "Dimension of S$ Array:",f15.0:wrt 6.1,T[6]
111: fmt 1: "Dimension of W$ Array:",f15.0,/:wrt 6.1,T[7]
112: 1+r1:eto "SELECT MODE"
113: "CALIBRATE":
114: if r1=1:jmp 2
115: dsp "Initialize must precede Scan":wait 3000:eto "INITIALIZE"
116: ent "Select SAM/SME (1 or 2)":C[1]
117: if C[1]#1 or C[1]#2:jmp -1
118: fmt 1.:/ "CALIBRATE: SAM/SME:",f5.0:wrt 6.1,C[1]
119: if C[1]=2:jmp 2
120: "SAM 1":-6.71709e-2+C[2]:0+C[3]:6.71592e-2+C[4]:jmp 2
121: "SAM 2":-6.7182e-2+C[2]:0+C[3]:6.71597e-2+C[4]
122: fnd 6: dsp "- Ernie's anals used:":C[2]:stp
123: dsp "+ Ernie's anals used:":C[4]:stp
124: dsp "Check connection to SAM":C[1]:stp
125: 0+C[6]:-C[9]+C[10]:163920-C[7]:327840+C[8]:eto 150
126: dsp "SAM LOCK On":stp
127: dsp "IFAR COUNT RESET on EXT":stp
128: buf "DUMMY":dsp "press INITIALIZE on DAS":tfr 8,"DUMMY"
129: "Repeat":dsp "SAM Lock on P0P5":stp
130: dsp "Check for Integrator 'IN'":stp
131: dsp "Zero both IFAR and DAS Counters":stp
132: 'CALTRANS'(1)+C[6]:F+C[16]:r17+MC[1]
133: dsp "Bumper B (Integrator 'OUT')":stp
134: 'CALTRANS'(2)+C[10]:r17+MC[5]
135: dsp "SAM Lock on P1P4":stp
136: dsp "Check for Integrator 'IN'":stp
137: 'CALTRANS'(1)+C[7]:F+C[17]:r17+MC[2]
138: dsp "Bumper A (Integrator 'OUT')":stp
139: 'CALTRANS'(2)+C[9]:r17+MC[4]
140: dsp "SAM Lock on P2P3":stp
141: dsp "Check for Integrator 'IN'":stp
142: 'CALTRANS'(1)+C[8]:F+C[18]:r17+MC[3]
143: dsp "SAM Lock on P0P5":stp
144: dsp "Check for Integrator 'IN'":stp
145: 'CALTRANS'(1)+r3:F+r15:r17+MC[6]
146: MC[6]-MC[1]+r18:r3-C[6]:r20:r20/r18+r19
147: if r18<0 or abs(r20)>15:dsp "Repeat Calibration":wait 2000:eto "Repeat"
148: "PrintCal":fmt 1.:/ "Along Scan Calibration":wrt 6.1
149: for I=1 to 5:r19(MC[6]-MC[1])+C[I+5]:C[I+5]:next I
150: sin(C[2])+r5:sin(.5C[2])+r6
151: C[6]-C[7]+r7:sin(C[4])+r8:sin(.5C[4])+r9
152: C[8]-C[7]+r10:(r5r10-r7r8)/(r6r8-r5r9)+C[13]
153: (r7+C[13]r6)/r5+C[12]:C[7]+C[11]
154: fmt 1.:/,2x,"Facet",2x,"IFAR Counts",5x,"Preset Anales",5x,"No,a,b"
155: wrt 6.1:fmt 1.3x,c4.4x,f9.2,4x,2e15.7
156: for I=1 to 3:wrt 6.1,D[I],C[I+5],C[I+1],C[I+10]:next I
157: (C[7]-C[6])/(C[8]-C[6])+C[5]
158: fmt 1.:/,4x,"K =",f10.6:wrt 6.1,C[5]
159: fmt 1.:/,4x,"Bumper A: ",f9.2:wrt 6.1,C[9]
160: fmt 1.4x,"Bumper B: ",f9.2,/:wrt 6.1,C[10]
161: dsp "check value of K":stp
162: 1+r4:eto "SELECT MODE"
163: "SCAN":

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151: if r4>0: jmp 2
153: dsp "Calibrate must precede Scan" wait 3000; goto "CALIBRATE"
155: dsp "SAM LOCK Off: Start Mirror Scan" istp
157: dsp "insure vacuum less than 5 TORR" istp
159: dsp "insure vacuum pump is off" istp
161: dsp "insure table is floating" istp
170: trk 1; ldf 5
171: "SUBROUTINES":
172: "CALTRANS": buf "CAL" ifmt 1,/, "Along", 5x, "Cross", 5x, "Octal A", 5x, "B"
173: wrt 6.1; dsp "Transferring Data" wait 5000; 0+r11
174: red 717, r21: 60int(1e2frc(1e-6r21))+int(1e2frc(1e-4r21))+r17
175: r17+1e2frc(1e-2r21)/60+r17
176: "Loop": buf "CAL" ifmt 1,2f10.2, 2x, fz6.0, 2x, fz6.0; tfr 8, "CAL"
177: rds("CAL")>C; if C=-1; jmp 0
178: cmprdb("CAL")>A; cmprdb("CAL")>B
179: if bit("xxxxxxxxxxxx", A); jmp 5
180: fmt 1,/, "Cross Data not 4XXX", /; wrt 6.1
181: 0+C; buf "DUMMY" tfr 8, "DUMMY"
182: rds("DUMMY")>C; if C=-1; jmp 0
183: 0+r11; goto "Loop"
184: cll "IFARAC" E+r12>E; F+r13>F; wrt 6.1, r12, r13, dtoA, dtoB; r11+1>r11
185: if r11=1; 0>E>F
186: wait 1000; if r11<Z[p1]+1; goto "Loop"
187: E<Z[p1]>E; F<Z[p1]>F; ffmt 1, "Average", f16.2, 5x, "Minutes:", f10.2, /
188: wrt 6.1; E-r17; ret E
189: "IFARAC": 3f16shf(A, 12)+2shf(B, 1)+shf(shf(B, -15), 15)-C141>r12
190: shf(shf(A, -5), 5)-C151>r13; ret
*12376

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0: "400data collection, 2; tape AT-FM, trk1, file 5, rev 121800":
1: dim S$(16), W$(16); buf "SCAN", S$, 4; buf "DUMP", 29, 4
2: "Init": dsp "press INITIALIZE on DAS" istp
3: 0+C; buf "INIT" tfr 8, "INIT"
4: rds("INIT")>C; if C=-1; jmp 0
5: "Scan": buf "SCAN" -1>K+C; 2I[6]-1>r1; dsp "press SCAN on DAS"
6: 19>r2; if K=-1; 24>r2
7: tfr 8, "SCAN", r2; K+2>K; dsp "Transferring Data"
8: rds("SCAN")>C; if C=-1; jmp 0
9: buf "DUMP" tfr 8, "DUMP"
10: rds("SCAN")>D; if D=-1; jmp 0
11: fti (C)>W[K]; if K<r1; jmp -5
12: dsp "I-1>r3: 'GETS$'+A; 'GETS$'+A
13: 'IFARA'(1,1)>r1; 'IFARA'(I[6]-1,1)>r2
14: 'IFARC'(1,1)>r4; 'IFARC'(I[6]-1,1)>r5
15: fxd 0; dsp "ALONG: P0=", r1, " P0(last)=", r2; istp
16: dsp "CROSS: P0=", r4, " P0(last)=", r5; istp
17: if 'MODE'=0; if abs(r1)>200 or abs(r2-r1)>5; goto "RESET"
18: goto "CONT"
19: "RESET": dsp "reset on P0 3sec & on EXT" istp
20: goto "Scan"
21: "CONT": -1>r3; 'GETS$'+A; 'GETS$'+B
22: 'GETS$'+A; 'GETS$'+B
23: 2f12-1-shf(shf(B, -4), 4)>r1
24: 2f5shf(A, 1)+2f4shf(shf(A, -15), 15)+shf(B, 12)>r2
25: if r1#400 or r2#0; dsp "check SCAN and TIME COUNT" wait 3000; goto "Init"
26: "CHK DATA": fxd 0; 'MODE'>r0
27: for I=1 to I[6]

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28: 'IFARRA'(I,1)+r2:2(4-Imod2)+r3
29: 'IFARRA'(I)+r4:2(3+Imod2)+r5
30: if abs(r2-C[r3])>4000:dsp "bad IFARRA at scan",I,r2:stp
31: if abs(r4-C[r5])>4000:dsp "bad IFARRA at scan",I,r4:stp
32: if r0=1:eto "BUMPER"
33: "SAM":60743-'LINE'(I,2.5,1.5)-'LINE'(I,1,1.5)+r1:dsp "AST",I,r1
34: if abs(r1-60743)<100:eto "NEXT"
35: eto "BAD"
36: "BUMPER":'LINE'(I,1,3,1)+r1:dsp "BUMPER TIME",I,r1
37: if abs(r1-71343)<100:eto "NEXT"
38: "BAD":beep:dsp "unacceptable word count":stp
39: eto "Init"
40: "NEXT":next I
41: ent "temporary tape storage(max 6ch)",Q[37,42]
42: ent "Track for Data(0 or 1)",T[1]
43: ent "File for Init/Cal Data",T[2]
44: T[2]+1+T[3]
45: trk 1:ldf 6
46: "SUBROUTINE":
47: "GETS#":r3+2+r3:ret cmpitf(S[r3,r3+1])
48: "IFARRA":10+4p2-3+p3;if p1#1:2itf(W[2p1-3,2p1-2])+4p2-3+p3
49: cmpitf(S[p3+2,p3+3])+p4:cmpitf(S[p3,p3+1])+p5
50: ret 2+16shf(p5,12)+2shf(p4,1)+shf(shf(p4,-15),15)-C[14]
51: "IFARC":10+4p2-3+p3;if p1#1:2itf(W[2p1-3,2p1-2])+4p2-3+p3
52: ret shf(shf(cmpitf(S[p3,p3+1]),-5),5)-C[15]
53: "LINE":2itf(W[2p1-1,2p1])-34+p7
54: 0+p10:for M=0 to p3-.5 by .5
55: p2=M+p5:int(p5)+p6
56: p6+2(p6mod2)-1+p12:8(p5mod1)+p13
57: itf(S[p7+p12-1,p7+p12])+p8:shf(shf(p8,-8),8)+p8
58: 0+p9:for L=0 to 3:p9+2+(3-L)bit(L,p13,p8)+p9:next L
59: 16p10+p9+p10:next M:p10+R;if p4=1:jmp 2
60: if 16+(p3/.5)/2-1<p10:p10-16+(p3/.5)+p10
61: p10+P:p10/5.3064375+p11:ret p11
62: "MODE":c1l 'TELE'(1,2):ret bit(S,R)
63: "TELE":2itf(W[2p1-1,2p1])-8+p6
64: 0+p9:for M=2 to 5:if pM=0:jmp 4
65: pM+2(pMmod2)-1+p11:itf(S[p6+p11-1,p6+p11])+p7:shf(shf(p7,-8),8)+p7
66: 0+p8:for L=0 to 7:p8+2+(7-L)bit(L,p7)+p8:next L:p8+R
67: 256p9+p8+p9:next M
68: if 256+(M-2)/2-1<p9:p9-256+(M-2)+p9
69: p9+P:p9/5.3064375+p10:T:ret p10
70: "IFARRA":2itf(W[2p1-1,2p1])-29+p2
71: cmpitf(S[p2+2,p2+3])+p3:shf(shf(p3,-15),15)+2shf(p3,1)+p4
72: ret p4+2+16shf(cmpitf(S[p2,p2+1]),12)-C[14]
*809
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0: "400data collection,3:tapeAT-FM,trk1,file6,rev121880":
1: dsp "Scanning Temperatures & Voltages"
2: "ENTER PROPER CHARACTERISTICS FOR EACH SCANNER CHANNEL":
3: "0-3":1.31+Q[27]:2.52+Q[28]:3.52+Q[29]:4.52+Q[30]
4: "4-7":5.11+Q[31]:6.11+Q[32]:7.11+Q[33]:8.11+Q[34]
5: "8-11":9.11+Q[35]:10.21+Q[36]:11.11+Q[37]:12.42+Q[38]
6: "12-15":13.31+Q[39]:14.31+Q[40]:15.42+Q[41]:16.42+Q[42]
7: "16-19":17.31+Q[43]:18.42+Q[44]:19.42+Q[45]:20.42+Q[46]
8: "Des C"+T[1]: "Volts"+T[2]: "mAmps"+T[3]
9: "QUARTER "+U[1]: "EU=6.81 "+U[2]: "EU=+27I "+U[3]: "EU=-27I "+U[4]
```

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10: "SMA -Z " +U$(5); "SMA -X " +U$(6); "SMA +Z " +U$(7); "SMA +X " +U$(8)
11: "TORQ. BRDG" +U$(9); "SME TEMP " +U$(10); "SAM TEMP " +U$(11)
12: "EU=6.8V " +U$(12); "MF(-Z-X) " +U$(13); "MF(+Z+X) " +U$(14)
13: "SME(1)TEL" +U$(15); "SME(2)TEL" +U$(16); "SME PR U7" +U$(17)
14: "SAM1/BMP2" +U$(18); "EU=+27V " +U$(19); "EU=-27V " +U$(20)
15: fmt 1,/, "Temperatures and Voltages"; wrt 6.1
16: fmt 1, " Ch", 3x, "Scanner Out", 5x, "Device", 6x, "Cal", 9x, "Measurement"
17: wrt 6.1; fmt 1, f5.0, 3x, e11.4, 5x, c9, f5.0, f16.3, 1x, c5
18: fmt 2, f5.0, 3x, e11.4, 5x, c9, f5.0, " ERROR"; fmt 9, fz2.0; rem 722
19: for J=0 to 19
20: 10frc(10Q(J+27))/r1; if r1=1; wrt 722, "F4R7T1M3A1H1"; jmp 2
21: wrt 722, "F1R7T1M3A1H1"; if r1#2; dsp "Error: Sensor Type =", r1; end
22: wrt 709.9, J; if abs(J-1.5)<2; wait 15000
23: red 722; Q(J+7)
24: 9999.999+Q(J+47); int(10frc(Q(J+27)))/r2
25: if r2<1 or r2>5; dsp "Error: Calibration =", r2; end
26: int(Q(J+27)+r27); if r27<1 or r27>20; dsp "Error: Device =", r27; end
27: 1+r28; if Q(J+7)>1e6; -9999.999+Q(J+7); sto "Error"
28: if r2=2; sto "CUR2"
29: if r2=3; sto "SEN3"
30: if r2=4; 2+r28; sto "VOLT4"
31: if r2=5; 3+r28; sto "AMP5"
32: "CUR1": 7167.9+r3; 5700+r4; 4564.7+r5; 3680.1+r6; 2985.8+r7; 2437.2+r8; 2001+r9
33: 1652.1+r10; 1373+r11; 1146+r12; 901.5+r13; 809.5+r14
34: -5+r15; 0+r16; 3+r17; 10+r18; 15+r19; 20+r20; 25+r21; 30+r22
35: 35+r23; 40+r24; 45+r25; 50+r26
36: if Q(J+7)>r3; sto "Error"
37: for K=4 to 14; if Q(J+7)<rK; jmp 2
38: (r(K+12)-r(K+11))(Q(J+7)-r(K-1))/(rK-r(K-1))+r(K+11)+Q(J+47); sto "Print"
39: next K; sto "Error"
40: "CUR2": 5778+r3; 4530+r4; 2850+r5; 1839+r6; 1218.5+r7; 1000+r8; 826.5+r9; 573+r10
41: 404.8+r11; 291.6+r12; 213.8+r13; -15+r14
42: -10+r15; 0+r16; 10+r17; 20+r18; 25+r19; 30+r20; 40+r21; 50+r22; 60+r23; 70+r24
43: if Q(J+7)>r3; sto "Error"
44: for K=4 to 13; if Q(J+7)<rK; jmp 2
45: (r(K+11)-r(K+10))(Q(J+7)-r(K-1))/(rK-r(K-1))+r(K+10)+Q(J+47); sto "Print"
46: next K; sto "Error"
47: "SEN3": (Q(J+7)-12175)/-127.096+Q(J+47); sto "Print"
48: "VOLT4": Q(J+7)+Q(J+47); sto "Print"
49: "AMP5": if J=1; 1e5Q(J+7)+Q(J+47)
50: if J=2 or J=3; 2e4abs(Q(J+7))+Q(J+47)
51: "Print": wrt 6.1, J, Q(J+7), U$(r27), r2, Q(J+47), T$(r28); jmp 2
52: "Error": wrt 6.2, J, Q(J+7), U$(r27), r2
53: next J; wrt 6
54: dsp "connect sys clock to counter"; sto
55: rem 710; wrt 710, "PF4G6A3A7"
56: trs 710; wait 11000; red 710, Q(67); lcl 710
57: fmt 1,/, "====="; wrt 6.1
58: fmt 1, "IF 'ERROR 60' OCCURS DURING MARKING OF TAPE: "; wrt 6.1
59: fmt 1, "type: sto REMARK---press execute---press continue "; wrt 6.1
60: fmt 1, "====="; wrt 6.1
61: "RECORD": r1+1+r1; fmt 1,/, "Data Tape Identifier:", 14x, 6c; wrt 6.1, Q$(37,42)
62: 0+r1; fmt 1, "Track for Data:", f21.0; wrt 6.1, T[1]
63: fmt 1, "Init/Cal Data File Number:", f10.0; wrt 6.1, T[2]
64: fmt 1, "Scan Data File Number:", f14.0; wrt 6.1, T[3]
65: dsp "Insert Normal Data Tape", Q$(37,42); sto
66: trk T[1]; fdf T[2]; tlist
67: dsp "files in printout will be erased"; sto
68: dsp "marking files"
69: trk T[1]; fdf T[2]; wrk 1, 1018; wrk 1, T[6]+T[7]+16
70: dsp "Recording Files"
```

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71: trk TC[1];rcf TC[2],C[*],I[*],O[*],Q*,TC[*]
72: cll 'CODES$'(10001000);rcf TC[3],S*,W*
73: sto +1; if A=0; dsp "Insert Reserve Data Tape",O$[37,42]; 1+A; sto ; sto -7
74: dsp "Data Collected: Finished"; sto
75: "SUBROUTINE":
76: "CODES$": 'btd' (p1)+p2; p(2)2+8+p3; if p3>2+15-1; p3-2+16+p3
77: fti (p3)+S$[1,1]; ret p2
78: "btd": p1+p2; 0+p4; for L=0 to 7; p2mod10+p3; if p3>1; ret ie-10
79: p4+p(3)2+L+p4; int(p2/10)+p2; next L; ret p4
80: "GETS$": r3+2+r3; ret cmpitf(S$(r3,r3+1))
81: "REMARK": dsp "TAPE IS FULL-press continue"; sto
82: dsp "INSERT NEW (NORMAL) DATA TAPE"; sto
83: rewitrk 0; dsp "MARKING TRK 0"; mark 1,20
84: rewitrk 1; dsp "MARKING TRK 1"; mark 1,20; wait 500
85: dsp "INSERT NEW (RESERVE) DATA TAPE"; sto
86: rewitrk 0; dsp "MARKING TRK 0"; mark 1,20
87: rewitrk 1; dsp "MARKING TRK 1"; mark 1,20; wait 500
88: sto "RECORD"; 10+r1
*16613
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DATA SHEET 5.2.1

TEST COMPUTER

PROGRAM LISTINES

PROGRAM NAME: _____

SMA Designation 5-1 S/N 4 400 scan period repeatability
TAPE 5-1 TRK 1 FILE 15 SHEET 1 OF 1

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0: fnt 1, "400scan period repeatability;tapeAT-FM, trk1, file15, rev121680"
1: wrt 6.1
2: dim C[35], I[15], Q[70], Qs[50], T[10]
3: dim A[11]:rad
4: dsp "Insert Data Tape":sto
5: ent "Track for Data", r0
6: ent "File for Init/Cal Data", r1
7: dsp "Loading Init/Cal Data"
8: trk r0:ldf r1, C[*], I[*], Q[*], Qs, T[*]
9: fnt 1, "Data Date: ", fz6.0, 5x, "Data Time: ", fz4.0: wrt 6.1, Q[11], Q[2]
10: fnt 1, "SMA Designation: ", 3x, 32ci: wrt 6.1, Qs[1, 32]
11: fnt 1, "Serial Number: ", 5x, 3ci: wrt 6.1, Qs[33, 35]
12: fnt 1, "Test Flow Event: ", 3x, 1ci: wrt 6.1, Qs[36, 36]
13: fnt 1, "Sequence Number: ", f4.0: wrt 6.1, Q[3]
14: fnt 1, "Data Tape Identifier: ", 14x, 6ci: wrt 6.1, Qs[37, 42]
15: fnt 1, "Track for Data: ", f21.0: wrt 6.1, T[1]
16: fnt 1, "Init/Cal Data File Number: ", f10.0: wrt 6.1, T[2]
17: fnt 1, "Scan Data File Number: ", f14.0: wrt 6.1, T[3]
18: fnt 1, "Norm/Avg Scan Data File Number: ", f5.0: wrt 6.1, T[4]
19: dsp "Loading Scan Data"
20: dim S[T[6]], W[T[7]]:buf "SCAN", S$, 4:ldf T[3], S$, W$
21: 'MODE'+r0
22: dsp "Load Sheet 4.3.5-1 (p81)":sto
23: pcir: wrt 705, "IP571, 806, 8177, 10960"
24: scl 1, 8.5, 1, 11:csiz 1.2, 2:pen# 1
25: dsp "Align paper using two boxes"
26: plt 1, 1, .85:pen:plt 7.46, 10, .05:plt 10, 10, 1:sto
27: if r0=1:sto "BUMPER"
28: "SAM":1e6Q[6]+r16+r17
29: for I=1 to I[6]:'AST'(I)+r18:if abs(r18-r16)>abs(r17-r16):r18+r17
30: next I:sto 35
31: "BUMPER":71343+r16+r17
32: for I=1 to I[6]:'LINE'(I, 1, 3, 1)+r18
33: if abs(r18-r16)>abs(r17-r16):r18+r17
34: next I
35: I-1+I:r16+abs(r17-r16)+r17:if r17-r16<3:r16+3+r17
36: "PLOT SCAN PERIODS: COMPUTE MEAN AND SIGMA":
37: scl -.1I[6], 1.15I[6], r16-(r17-r16)(5-1)/2.45, r16+(r17-r16)(11-5)/2.4
38: int(I[6]/4)+r14:if r14<1:1+r14
39: fxd 0:xax r16, r14, 0, I[6], 1:yax 0, r17-r16, 2r16-r17, r17, 1
40: fxd -.2I[6], 1.2I[6], r16-1.2(r17-r16), r16+1.2(r17-r16)

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42: 3-Imod2+r6;if r0=0:'AST'(1)+r7
43: if r0=1:'LINE'(1,1,3,1)+r7
44: r5=r7+r5;alt 1,r7;next 1
45: r2/r4+r2;r3/r5+r3;0+r10+r11;for I=1 to 116;Imod2+r9
46: if r0=0:'AST'(1)-r(3-r9)+r(11-r9)+r(11-r9)
47: if r0=1:'LINE'(1,1,3,1)-r(3-r9)+r(11-r9)+r(11-r9)
48: next I;pen
49: for J=1 to 2;Jmod2+r12;r(5-r12)-1+r13;if r13=0;1+r13
50: r(r(11-r12)/r13)+r(11-r12);next J
51: scl 1,8,5,1,1;fxd 2;lim 0,8,5,0,11
52: plt 2,9,5,1;lbl Q[1,32]
53: plt 3,7,9,5,1;lbl Q[33,35]
54: fxd 0;plt 5,3,9,5,1;lbl Q[1]
55: plt 5,4,9,3,1;fxd 1;lbl Q[65], " ",Q[66], " ",Q[58]
56: fxd 2;plt 4,9,6,1;if r0=1;sto "BUMPER MODE"
57: if r0=0;lbl "SAM MODE"
58: plt 4,9,2,9,1;fxd 0;lbl r16;plt 5,02,2,75,1;lbl "+-.3"
59: plt 4,9,2,55,1;lbl r16;plt 5,02,2,4,1;lbl "+-.3"
60: fxd 2;plt 4,2,2,85,1;lbl r2;cll 'PASSFAIL'(r2,r16-.3,r16+.3,5,7,2,85)
61: plt 6,2,85,1;lbl r10;cll 'PASSFAIL'(r10,0,2,9,7,7,2,85)
62: plt 4,2,2,5,1;lbl r3;cll 'PASSFAIL'(r3,r16-.3,r16+.3,5,7,2,5)
63: plt 6,2,5,1;lbl r11;cll 'PASSFAIL'(r11,0,2,9,7,7,2,5);sto 71
64: "BUMPER MODE":lbl "BUMPER MODE"
65: plt 4,9,2,9,1;fxd 0;lbl r16;plt 5,02,2,75,1;lbl "+-.8"
66: plt 4,9,2,55,1;lbl r16;plt 5,02,2,4,1;lbl "+-.8"
67: fxd 2;plt 4,2,2,85,1;lbl r2;cll 'PASSFAIL'(r2,r16-.8,r16+.8,5,7,2,85)
68: plt 6,2,85,1;lbl r10;cll 'PASSFAIL'(r10,0,2,9,7,7,2,85)
69: plt 4,2,2,5,1;lbl r3;cll 'PASSFAIL'(r3,r16-.8,r16+.8,5,7,2,5)
70: plt 6,2,5,1;lbl r11;cll 'PASSFAIL'(r11,0,2,9,7,7,2,5)
71: fxd 0;plt 6,8,1;lbl r4," FWD"
72: plt 6,7,8,1;lbl r5," REV"
73: plt 1,5,1,5,1;fxd 4;lbl Q[1]+Q[2]/1e4
74: plt 2,1,1,25,1;fxd 0;lbl Q[36,36], "-",Q[43,44], " see ",Q[3]
75: plt 1,7,1,05,1;lbl "test no.",Q[43,44]
76: pen# idss "Finished";sto
77: "SUBROUTINES":
78: "AST":ret 60743-'LINE'(p1,2,5,1,5)-'LINE'(p1,1,1,5)
79: "PASSFAIL":'P'+A$;if p1<p2 or p1>p3;'F'+A$
80: plt p4,p5,1;lbl A$;ret
81: "LINE":2itf(W[2p1-1,2p1])-34+p7
82: 0+p10;for M=0 to p3-.5 by .5
83: p2+M+p5;int(p5)+p6
84: p6+2(p6mod2)-1+p12;8(p5mod1)+p13
85: itf(S[p7+p12-1,p7+p12])+p8;shf(shf(p8,-8),8)+p8
86: 0+p9;for L=0 to 3;p9+2+(3-L)bit(L+p13,p8)+p9;next L
87: 16p10+p9+p10;next M;p10+R;if p4=1;jmp 2
88: if 16+(p3/.5)/2-1<p10;p10-16+(p3/.5)+p10
89: p10+P;p10/5.3064375+p11;ret p11
90: "MODE":cll 'TELE'(1,2);ret bit(5,R)
91: "TELE":_itf(W[2p1-1,2p1])-8+p6
92: 0+p9;for M=2 to 5;if pM=0;jmp 4
93: pM+2(pMmod2)-1+p11;itf(S[p6+p11-1,p6+p11])+p7;shf(shf(p7,-8),8)+p7
94: 0+p8;for L=0 to 7;p8+2+(7-L)bit(L,p7)+p8;next L;p8+R
95: 256p9+p8+p9;next M
96: if 256+(M-2)/2-1<p9;p9-256+(M-2)+p9
97: p9+P;p9/5.3064375+p10+T;ret p10
```

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TS 32015-004
Rev 3

DATA SHEET 9.2.1

TEST COMPUTER

PROGRAM LISTINGS

PROGRAM NAME: _____

SMA Designation F-1 S/N 4 400 SCAN PARAMETERS
TAPE F-1 TRK 1 FILE 16.17 SHEET 1 OF _____

```
0: fmt 3, "400scan parameter, 1; tape F-1, trk 1, file 16, rev 121880"
1: wrt 6.0; rad
2: dim A$(1)
3: dim K$(2,3); "FWD"→K$(1); "REV"→K$(2)
4: dim D$(6,8); "CORR"→D$(1); "CORR/AVG"→D$(2); "NORM"→D$(3); "NORM/AVG"→D$(4)
5: "RAW"→D$(5); "RAW/AVG"→D$(6)
6: dim Q(25); I(15); Q(70); Q$(50); TC(10); DC(10)
7: dsp "Insert Data Tape"; istp
8: ent "Track for Data"; r0
9: ent "File for Init/Cal Data"; r1
10: dsp "Loading Init/Cal Data"
11: trk r0; ldf r1, Q(1); I(1); Q(1); Q$, TC(1)
12: fmt 1, 4, "SMA Designation: ", 3x, 32; wrt 6.1, Q$(1,32)
13: fmt 1, "Serial Number: ", 5x, 3; wrt 6.1, Q$(33,35)
14: fmt 1, "Run Number: ", 7x, f11.4; wrt 6.1, Q(1)+Q(2)/1e4
15: fmt 1, "Test Flow Event: ", 3x, 1; wrt 6.1, Q$(36,36)
16: fmt 1, "Sequence Number: ", f4.0; wrt 6.1, Q(3)
17: fmt 1, 4, "Data Tape Identifier: ", 14x, 6; wrt 6.1, Q$(37,42)
18: fmt 1, "Track for Data: ", f21.0; wrt 6.1, TC(1)
19: fmt 1, "Init/Cal Data File Number: ", f10.0; wrt 6.1, TC(2)
20: fmt 1, "Scan Data File Number: ", f14.0; wrt 6.1, TC(3)
21: "GET DATA":
22: dim S$(TC(1)); W$(TC(1)); buf "SCAN", S$, 4; trk TC(1)
23: dsp "loading SCAN data, file", TC(3); ldf TC(3), S$, W$
24: shf(itf(S$(1,2)), 8) mod 16→r0
25: dsp "only", D$(r0-3), "is available"; istp
26: 'MODE'→r48; bit(6, R)→r47
27: fmt 1, 4, "DATA USED FOR COMPUTATIONS : ", 8; wrt 6.1, D$(r0-3); wrt 6
28: Q(67)→r0
29: 0→r3
30: 1e10→r14+r18; -1e10→r4+r15+r19; fxd 0
31: for I=1 to I(6); dsp "computing means of scan #".I
32: r3+'TELE'(I, 6, 7)→r3
33: 10719-'TELE'(I, 4, 5)→r6
34: if r48=0; 60743-'LINE'(I, 2.5, 1.5)-'LINE'(I, 1, 1.5)→r13
35: if r48=1; 'LINE'(I, 1, 3, 1)→r13
36: 1e6'ANGA'('IFARA'(I, 1))→r27
37: abs(1e6'ANGA'('IFARAF'(I))-r27)→r39
38: r22+r13→r22
39: if I mod 2=0; sto 45
40: r39+r40→r40
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```
42: min(r13,r18)+r18;max(r13,r19)+r19;r20+r13+r20
43: r28+(r27-1e6'ANGA'(C[61]))+r28
44: sto 48
45: r33+r42-r42
46: r7+r6+r7
47: min(r13,r14)+r14;max(r13,r15)+r15;r16+r13+r16
48: next I:I-1+1
49: r3/I+r3;r22/I+r22
50: (I+Imod2)/2+r44;I-r44+r45
51: r9/r44+r9;r20/r44+r20;r28/r44+r28;r40/r44+r40
52: r7/r45-r7;r16/r45-r16;r42/r44+r42
53: 2r22+r31;if r48=0;r31+r7+r9+r31
54: 100(r14/r22-1)+r34;100(r15/r22-1)+r35
55: 100(r18/r22-1)+r36;100(r19/r22-1)+r37
56: 8+r4+r41
57: for I=1 to I[63];dsp "computing sigma of scan #",I
58: r4+'TELE'(I,6,7)-r3)t2+r4
59: 10719-'TELE'(I,4,5)+r6
60: if r48=0;60743-'LINE'(I,2,5,1.5)-'LINE'(I,1,1.5)+r13
61: if r48=1;'LINE'(I,1,3,1)+r13
62: 1e6'ANGA'('IFARA'(I,1))+r27
63: abs(1e6'ANGA'('IFARRAF'(I))-r27)+r39
64: r28+(r13-r22)t2+r28
65: if 1e6'ANGA'=0;sto 71
66: r41+(r39-r40)t2+r41
67: r18+(r6-r9)t2+r18
68: r21+(r13-r20)t2+r21
69: r29+(r27-1e6'ANGA'(C[61])-r28)t2+r29
70: sto 74
71: r43+(r39-r42)t2+r43
72: r8+(r6-r7)t2+r8
73: r17+(r13-r16)t2+r17
74: next I:I-1+1
75: r(r23/(I-1))+r23
76: r(r4/(I-1))+r4
77: r(r10/(r44-1))+r10;r(r21/(r44-1))+r21;r(r29/(r44-1))+r29
78: r(r8/(r45-1))+r8;r(r17/(r45-1))+r17
79: r(r41/(r44-1))+r41;r(r43/(r45-1))+r43
80: dsp "insert tape AT";sto
81: trk 1;ldf 17
82: "SUBROUTINES":
83: "ANGA":asn((2(p1-C[11])+C[13])/r(4C[12]t2+C[13]t2))+p2
84: ret p2-atn(.5C[13]/C[12])
85: "IFARA":10+4p2-3+p3;if p1#1;2itf(W#[2p1-3,2p1-2])+4p2-3+p3
86: cmpitf(S#[p3+2,p3+3])+p4;cmpitf(S#[p3,p3+1])+p5
87: ret 2t16shf(p5,12)+2shf(p4,1)+shf(shf(p4,-15),15)-C[14]
88: "IFARRAF":2itf(W#[2p1-1,2p1])-29+p2
89: cmpitf(S#[p2+2,p2+3])+p3;shf(shf(p3,-15),15)+2shf(p3,1)+p4
90: ret p4+2t16shf(cmpitf(S#[p2,p2+1]),12)-C[14]
91: "LINE":2itf(W#[2p1-1,2p1])-34+p7
92: 0+p10;for M=0 to p3-.5 by .5
93: p2+M+p5;int(p5)+p6
94: p6+2(p6mod2)-1+p12;8(p5mod1)+p13
95: itf(S#[p7+p12-1,p7+p12])+p8;shf(shf(p8,-8),8)+p8
96: 0+p9;for L=0 to 3;p9+2t(3-L)bit(L+p13,p8)+p9;next L
97: 16p10+p9+p10;next M;p10+R;if p4=1;jmp 2
98: if 16t(p3/.5)/2-1<p10;p10-16t(p3/.5)+p10
99: p10+P;p10/.5.3064375+p11;ret p11
100: "MODE":c11 'TELE'(I,2);ret bit(5,R)
101: "TELE":2itf(W#[2p1-1,2p1])-8+p6
102: 0+p9;for M=2 to 5;if pM=0;jmp 4
103: pM+2(pMmod2)-1+p11;itf(S#[p6+p11-1,p6+p11])+p7;shf(shf(p7,-8),8)+p7
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14: 0-p8:for L=0 to 7:ip8+2*(7-L)bit(L,p7)+p8:next L:ip8+R
15: 256p8+p8-p9:next M
16: 1: 256*(M-2)/2-1+p9:p9-256*(M-2)+p9
17: p9+Pip9/5.3864375+p10+T:ret p10
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"400scan parameter:2:tapeAT-FM, trk1, file17":
fmt 3, "400scan parameter: tapeAT, rev121880"
2: fmt 1, "-----", z:for i=1 to 15:urt 6.1:next i
fmt 1, "attach to data sheet 4.3.5-2", 12x, z:urt 6.1:urt 6.3
fmt 1, "27x, OPERATIONAL PERFORMANCE":urt 6.1
3: fmt 1, "33x, SCAN PARAMETERS":urt 6.1
6: fmt 1, "SMA Designation:", c32, z:urt 6.1, Q[1,32]
fmt 2, "operation:", c6, z:if r47=0:urt 6.2, "SME(1)"
if r47=1:urt 6.2, "SME(2)"
9: fmt 3, c7:if r48=0:urt 6.3, "SAM"
if r48=1:urt 6.3, "BUMPER"
12: fmt 1, "Serial Number:", c3, 24x, "Test Flow Event:", c, "-", c2, " Seq", f2.0
13: urt 6.1, Q[33,35], Q[36,36], Q[43,44], Q[31]
14: fmt 1, "Run Number:", 4x, f11.4, 24x, "Voltages:", f5.1, f6.1, f4.1
15: urt 6.1, Q[11], Q[21], 1e4, Q[65], Q[66], Q[58]
16: fmt 1, "temperatures", z:urt 6.1
16: fmt 2, "T1 T2 T3 T4 T5 T6 T7 T8 T9"
urt 6.2
18: fmt 1, 12x, "(+Z) (-Z) (+X) (-X) (BRDG) (SAM) (SME) (-Z-X) (+Z-X)"
9: urt 6.1
20: fmt 1, "des C", 4x, 9f7.1
17: urt 6.1, Q[53], Q[51], Q[54], Q[52], Q[55], Q[57], Q[56], Q[59], Q[60]
21: fmt 1, "SCAN PARAMETER(", f3.0, " scans) MEASURED", z
23: fmt 2, 4x, "REQUIREMENT", 4x, "SPECIFICATION P/F":urt 6.1, r44+r45:urt 6.2
22: 10612875+r1:125+r2
24: fmt 1, "clock freq, HZ", 13x, f8.0, 4x, f8.0, " +-", f3.0, 15x, c3
25: urt 6.1, r0, r1, r2, 'P/F'(r0, r1-r2, r1+r2)
27: 1:80+r5:fmt 1, "torque pulse width, usec":urt 6.1
28: fmt 1, "mean", f27.0, 8x, z:urt 6.1, abs(r3)
29: fmt 2, "<", f4.0, 26x, c1:urt 6.2, r5, 'P/F'(abs(r3), 0, r5)
30: fmt 1, "sigma", f26.0:urt 6.1, r4
31: 10590+r11:68+r12
32: if r48=1:to "BUMPER"
33: fmt 1, "turn-around time, usec", 17x, z:urt 6.1
34: fmt 1, f5.0, " +-", f3.0:urt 6.1, r11, r12
35: r11-r12+r11:r11+2*r12+r12
36: fmt 1, "bumper A: mean", 13x, z:urt 6.1
37: fmt 1, f7.1, 36x, c1:urt 6.1, r7, 'P/F'(r7, r11, r12)
38: fmt 2, 10x, "sigma", 12x, z:urt 6.2
39: fmt 3, f7.1, 35x, c1:urt 6.3, r8
40: fmt 1, "bumper B: mean", 13x, z:urt 6.1
41: fmt 1, f7.1, 36x, c1:urt 6.1, r9, 'P/F'(r9, r11, r12)
42: urt 6.2:urt 6.3, r10
43: 2.9+r24:60743+r25:1.2+r26:fmt 1, "active scan time, usec"
44: urt 6.1
45: fmt 1, "fwd: min", 19x, f7.1:urt 6.1, r14
46: fmt 2, "max", 19x, f7.1:urt 6.2, r15
47: fmt 3, "mean", 18x, f7.1:urt 6.3, r16
48: fmt 4, "sigma", 17x, f7.1:urt 6.4, r17
49: fmt 1, "rev: min", 19x, f7.1:urt 6.1, r18

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50: wrt 6.2,r19;wrt 6.3,r20;wrt 6.4,r21
51: fmt 1,"combine: mean",f21.1,20x,f5.0," +-",f3.1,4x,c2
52: wrt 6.1,r22,r25,r26,'P/F'(r22,r25-r26,r25+r26)
53: fmt 1,"      sigma",13x,f7.1,20x,"<",f3.1,11x,c2
54: wrt 6.1,r23,r24,'P/F'(r23,0,r24)
55: 142686+r32;140+r33
56: fmt 1,"scan period, usec",9x,f8.1,5x,f6.0," +-",f3.0,18x,c2
57: wrt 6.1,r31,r32,r33,'P/F'(r31,r32-r33,r32+r33)
58: 1+r38;fmt 1,"scan rate var, percent",32x,"+-",f1.0;wrt 6.1,r38
59: fmt 1,"fwd: min",18x,f6.3,37x,c2;wrt 6.1,r34,'P/F'(r34,-r38,r38)
60: fmt 2,"      max",18x,f6.3,37x,c2;wrt 6.2,r35,'P/F'(r35,-r38,r38)
61: fmt 1,"rev: min",18x,f6.3,37x,c2;wrt 6.1,r36,'P/F'(r36,-r38,r38)
62: wrt 6.2,r37,'P/F'(r37,-r38,r38)
63: fmt 1,"SAM offset(P0 mean), urad",f8.2;wrt 6.1,r28
64: 1+r38;fmt 1,"line start pulse angular",wrt 6.1
65: fmt 1,"jitter(P0 sigma), urad",f11.2,21x,"<",f4.2,10x,c2
66: wrt 6.1,r29,r30,'P/F'(r29,0,r30)
67: fmt 1,"SAM angle, urad",wrt 6.1
68: fmt 1,"fwd: mean",18x,f6.0;wrt 6.1,r40
69: fmt 2,"      sigma",17x,f6.3,21x,"<",f1.0,13x,c2
70: wrt 6.2,r41,1,'P/F'(r41,0,1)
71: fmt 1,"rev: mean",18x,f6.0;wrt 6.1,r42
72: wrt 6.2,r43,1,'P/F'(r43,0,1)
73: sto "CONT"
74: "BUMPER":2.9+r24;171343+r25;.8+r26;fmt 1,"bumper to bumper time, usec"
75: wrt 6.1
76: fmt 1,"fwd: min",19x,f7.1;wrt 6.1,r14
77: fmt 2,"      max",19x,f7.1;wrt 6.2,r15
78: fmt 3,"      mean",18x,f7.1;wrt 6.3,r16
79: fmt 4,"      sigma",17x,f7.1;wrt 6.4,r17
80: fmt 1,"rev: min",19x,f7.1;wrt 6.1,r18
81: wrt 6.2,r19;wrt 6.3,r20;wrt 6.4,r21
82: fmt 1,"combine: mean",f21.1,20x,f5.0," +-",f3.1,4x,c2
83: wrt 6.1,r22,r25,r26,'P/F'(r22,r25-r26,r25+r26)
84: fmt 1,"      sigma",13x,f7.1,20x,"<",f3.1,11x,c2
85: wrt 6.1,r23,r24,'P/F'(r23,0,r24)
86: 142686+r32;1.6+r33
87: fmt 1,"scan period, usec",9x,f8.1,5x,f6.0," +-",f3.1,18x,c2
88: wrt 6.1,r31,r32,r33,'P/F'(r31,r32-r33,r32+r33)
89: fmt 1,"scan rate var, percent",wrt 6.1
90: fmt 1,"fwd: min",18x,f6.3,37x,c2;wrt 6.1,r34
91: fmt 2,"      max",18x,f6.3,37x,c2;wrt 6.2,r35
92: fmt 1,"rev: min",18x,f6.3,37x,c2;wrt 6.1,r36
93: wrt 6.2,r37
94: "CONT":fmt 1,"-----",z;for I=1 to 15;wrt 6.1;next I
95: fmt 1,2;wrt 6.1
96: dsp "finished";end
97: "SUBROUTINES":
98: "P/F": "P"+A$(1);if p1<p2 or p3<p1;"F"+A$(1)
99: ret A$(1)
*2860
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TS 32015-004

Rev B

DATA SHEET 5.2.1

TEST COMPUTER

PROGRAM LISTINGS

PROGRAM NAME: alone (SAM)

SMA Designation F-1 S/N 41 (and corr) repeatability
TAPE F-1 TRK 1 FILE 19-20-21 SHEET 1 OF 1

```
0: fnt 1;"alone(SAM, end cal)repeatability,1;tapeAT-FM, trk1, file19, rev121
1: wrt 6.1;rad
2: dim K$(2,3); "FWD"+K$(1); "REV"+K$(2)
3: dim D$(6,8); "CORR"+D$(1); "CORR/AVG"+D$(2); "NORM"+D$(3); "NORM/AVG"+D$(4)
4: "RAW"+D$(5); "RAW/AVG"+D$(6)
5: dim C$(25); TC(15); QC(70); Q$(50); TC(10); PC(50); DC(12)
6: dsp "insert data tape of recent TFE-H";stp
7: ent "track for smooth coeffs";r0;trk r0
8: ent "file for smooth coeffs";TC(5)
9: dsp "Loading Smooth Coeffs";ldf TC(5);PC(*)
10: fnt 1;/"smoothing coefficients-ALONE SCAN";wrt 6.1
11: fnt 1;"coeffs date:";fz6.0;5x;"coeffs time:";fz4.0;wrt 6.1;PC(1);PC(2)
12: fnt 1;/"order";8x;"forward";8x;"reverse";wrt 6.1
13: fnt 1;f5.0;5x;2e15.7;for I=0 to PC(3);wrt 6.1;I;PC(I+4);PC(I+14);next I
14: if PC(45)=0;dsp "smooth coeffs have not computed";end
15: fnt 1;"data used to generate smoothed coeffs :";c8;wrt 6.1;D$(PC(45)-
16: dsp "Insert Data Tape";stp
17: ent "Track for Data";r0
18: ent "File for Init/Cal Data";r1
19: dsp "Loading Init/Cal Data"
20: trk r0;ldf r1;C$(1);I$(1);QC(1);Q$(1);TC(*)
21: fnt 1;/"Data Date:";fz6.0;5x;"Data Time:";fz4.0;wrt 6.1;QC(1);QC(2)
22: fnt 1;/"SMA Designation:";3x;32c;wrt 6.1;Q$(1);321
23: fnt 1;"Serial Number:";5x;3c;wrt 6.1;Q$(33);351
24: fnt 1;"Run Number:";7x;f11.4;wrt 6.1;QC(1);QC(21)/1e4
25: fnt 1;"Test Flow Event:";3x;1c;wrt 6.1;Q$(35);361
26: fnt 1;"Sequence Number:";f4.0;wrt 6.1;QC(3)
27: fnt 1;/"Data Tape Identifier:";14x;6c;wrt 6.1;Q$(37);421
28: fnt 1;"Track for Data:";f21.0;wrt 6.1;TC(1)
29: fnt 1;"Init/Cal Data File Number:";f10.0;wrt 6.1;TC(2)
30: fnt 1;"Scan Data File Number:";f14.0;wrt 6.1;TC(3)
31: fnt 1;"Norm/Ave Scan Data File Number:";f5.0;wrt 6.1;TC(4)
32: dim S$(TC(5));W$(TC(7));buf "SCAN";S$,4;trk TC(1)
33: 4-r1;sto 35
34: dsp "Data for Computation";wait 2000
35: ent "3=RAW,4=CORR";r1;if r1<3 or r1>4;jmp 0
36: dsp "loading SCAN data: file";TC(r1);ldf TC(r1);S$,W$
37: shl (lff(S$(1,2)),8)mod16+r0
38: dsp "only";D$(r0-3);"is available";stp
39: r0-r0mod2+r0;dsp D$(r0-3);"is selected";stp
40: fnt 1;"DATA USED FOR COMPUTATIONS = ";3c;wrt 6.1;D$(r0-3);wrt 6
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42: 1: r38=11:ent "plot opt(0=norm,1=diff)",r37:0+r41
43: -or 1=1 to I[6]:if 'IFARRA'(I,I[14])='IFARRA'(I):1+Q[69]
44: next I
45: 2-r17-r18+r36+r31+r32-r33+r34+r35+r39+r40:fxd 0
46: for I=1 to I[6]-1:Imod2+r15:dsr "averaging SAM angles:", " scan",I
47: 1: r41=0:'OFFSET'(I)+r16
48: if r41=1:'offsetx'(I)+r16
49: r(18-r15)+r16+r(18-r15)
50: 3r15+r29:r(33-r29)+'IFARRA'(I,1)+r(33-r29)
51: r(34-r29)+'IFARRA'(I)+r(34-r29)
52: r(35-r29)+'IFARRA'(I)+r(35-r29)
53: r(40-r15)+'TIMEM'(I)+r(40-r15)
54: next I
55: 9-D[7]+D[8]:int(I[6]/2+.5)-1+D[1]:int(I[6]/2)+D[2]
56: r17/D[1]-r17:r30/D[1]+r30:r31/D[1]+r31:r32/D[1]+r32:r39/D[1]+r39
57: r18/D[2]-r18:r33/D[2]+r33:r34/D[2]+r34:r35/D[2]+r35:r40/D[2]+r40
58: r17+P[49]+r21:r18+P[50]+r22
59: dsr "insert 47 tape":sto
60: trk 1:ldf 20
61: "SUBROUTINES":
62: "ANGA":asn(2:p1-C[11])+C[13]/r(4C[12]+2+C[13]+2))+p2
63: ret p2-orn(5C[13]/C[12])
64: "IFARRA":2(p1-3-p2-3):if p1=1:2itf(W[2p1-3,2p1-2])+4p2-3+p3
65: cmpitf(8[p3-2,p3+1])+p4:cmpitf(8[p3,p3+1])+p5
66: ret 2+2shf(p3,12)+2shf(p4,1)+shf(shf(p4,-15),15)-C[14]
67: "IFARRA":2itf(W[2p1-1,2p1])+3-61+p2:if p1=I[6]:p2+2+p2
68: cmpitf(8[p2+2,p2+3])+p3:shf(shf(p3,-15),15)+2shf(p3,1)+p4
69: ret p4+2716shf(cmpitf(8[p2,p2+1]),12)-C[14]
70: "OFFSET":p1mod2+p8
71: C[3]+p2:C[4]+p4:p2/(p2-p4)+p3:if p8=0:p4/(p4-p2)+p3
72: "LINE"(p1+1,2.5,1.5)+p5:"LINE"(p1+1,1,1.5)+p6:60743-p5-p6+p7
73: 30371.4-p5+p11-p13:30371.6-p6+p12:if r0=6 or r0=7:1e6Q[6]p11/p7+p13
74: (p3-1)p11+p3p12+p9:1e6(p4-p2)/p7+p10:if p8=0:-p10+p10
75: p9p10+p14
76: (-1)p8'PRESS'Q[70]+p15
77: ret p14+p15
78: "offsetx":p1mod2+p8
79: "ANGA":'IFARRA'(p1))+p16
80: "ANGA":'IFARRA'(p1))+p2:"ANGA":'IFARRA'(p1))+p4:(p16-p2)/(p4-p2)+p3
81: "LINE"(p1+1,2.5,1.5)+p5:"LINE"(p1+1,1,1.5)+p6:60743-p5-p6+p7
82: 30371.4-p5+p11-p13:30371.6-p6+p12:if r0=6 or r0=7:1e6Q[6]p11/p7+p13
83: (p3-1)p11+p3p12+p9:1e6(p4-p2)/p7+p10
84: p9p10+p14
85: (-1)p8'PRESS'Q[70]+p15
86: ret p14+p15
87: "LINE":2itf(W[2p1-1,2p1])-60+p7:if p1=I[6]:p7+2+p7
88: 0+p10:for M=0 to p3-.5 by .5
89: p2+M+p5:int(p5)+p6
90: p6+2(p6mod2)-1+p12:8(p5mod1)+p13
91: itf(8[p7+p12-1,p7+p12])+p8:shf(shf(p8,-8),8)+p8
92: 0+p9:for L=0 to 3:p9+2t(3-L)bit(L+p13,p8)+p9:next L
93: 16p10+p9+p10:next M:p10+R:if p4=1:jmp 2
94: if 16t(p3/.5)/2-1<p10:p10-16t(p3/.5)+p10
95: p10-P:p10/5.3064375+p11:ret p11
96: "PRESS":ret itf(8[9,10])/100
97: "IFARRA":2(itf(W[2p1-1,2p1])+7)-61+p2:if p1=I[6]:p2+2+p2
98: cmpitf(8[p2+2,p2+3])+p3:shf(shf(p3,-15),15)+2shf(p3,1)+p4
99: ret p4+2716shf(cmpitf(8[p2,p2+1]),12)-C[14]
100: "TIMEM":2(itf(W[2p1-1,2p1])+9)-61+p2:if p1=I[6]:p2+2+p2
101: cmpitf(8[p2,p2+1])+p3:cmpitf(8[p2+2,p2+3])+p4
102: 275shf(p3,1)+274shf(shf(p3,-15),15)+shf(p4,12)+p5
103: "IFARRA"(p1)+p6:for M=int(I[8]/2,1) to I[8]:'IFARRA'(p1,M)+p7
104: 1e6(p5-p7)shf('IFARRA'(p1,M+1)-p7):next M
```

```

1 wrt 6,"clone(SAM, end cal)repeatability,2;tapeAT-PFM, trk1,fil20,rev101580"
2 fnt 1,c2,c7,2x,c8,2x,c7,2x,c6,2x,c8,2x,c8,2x,c7,2x,c7
3 fnt 2,r2,c7,f7.1,2x,f8.3,2x,f7.3,2x,f6.3,2x,f8.3,2x,f8.3,2x,f7.3,2x,f7.3
4 fnt 3,"==",5e15.8
5 fnt 4,5x,c3," AVERAGE SLOPE=",f10.7," rad/sec, sigma=",f5.2," urad/sec"
6 dsp "Data Print sf=1 icf=1 icf=2 istp
7 "max RMS & corresp MEAN":
8 0+r25+r26+r27+r28
9 "opt1":if r36=1;1e-6r21+r25;1e-6r22+r26
10 "opt2":if r36#2;sto "opt3"
11 -'PROFILE'(0,0,Q[61/2)+r25;- 'PROFILE'(1,0,Q[61/2)+r26
12 r25-1e-6r21+r27;r26-1e-6r22+r28;stp
13 "opt3":if r36#3;sto "opt4"
14 'ANGA'(r30)+r3;('ANGA'(r32)-r3)/'TIMEF'(I[61+1)+r4
15 r39+r2;r31+r5
16 'ANGA'(r5)-r2r4-r3+r6;-r6+r27
17 'ANGA'(r33)+r3;('ANGA'(r35)-r3)/'TIMEF'(I[61+2)+r4
18 r40+r2;r34+r5
19 'ANGA'(r5)-r2r4-r3+r6;-r6+r28
20 -'PROFILE'(0,0,Q[61/2)+r25;- 'PROFILE'(1,0,Q[61/2)+r26;stp
21 "opt4":
22 "SLOPE":
23 0+r23+r24+B+C
24 for I=1 to I[61-1;dsp "AVERAGING SLOPES, scan ",I
25 ('ANGA'('IFARAF'(I))- 'ANGA'('IFARA'(I,1)))/'TIMEF'(I)+A
26 if Imod2=1;r23+A-2.11+r23;B+(A-2.11)+2+B
27 if Imod2=0;r24+A+2.11+r24;C+(A+2.11)+2+C
28 if fl=2;wrt 6.3,r23,B,r24,C,A
29 next I;wrt 6
30 if fl=2;wrt 6.3,r23+2/DC[1],r24+2/DC[2],B-r23+2/DC[1],C-r24+2/DC[2]
31 r((B-r23+2/DC[1])/(DC[1]-1))+B;r23/DC[1]+2.11+r23
32 r((C-r24+2/DC[2])/(DC[2]-1))+C;r24/DC[2]-2.11+r24
33
34 wrt 6.4,"fwd",r23,1e6B
35 wrt 6.4,"rev",r24,1e6C
36 wrt 6
37
38 if fl=1=0;jmp 5
39 wrt 6.1,"J","SAMPLE","MEAS/AV","", "FWD","PARA-","TOTAL","DEV-"
40 wrt 6.1,"","TIME"," DEV ","SIGMA","PROFIL","BOLIC","CORR","CORR","RMS"
41 wrt 6.1,"","usec","urad","urad","urad","urad","urad","urad"
42 wrt 6.1,"","r2","C","S","E","G","E+G","C-(E+G)";wrt 6
43
44 for J=1 to I[14]+1;if J=I[14] and Q[69]=1;sto "SkipSample"
45 0+r7+r8+r9+r10;fxd 0
46 for I=1 to I[61-1;dsp "sample",J," scan",I
47 if Imod2=1;r23+r4
48 if Imod2=0;r24+r4
49
50 "FS":
51 if J=1;0+r2;'ANGA'('IFARA'(I,1))+E;sto "CD"
52 if J=I[14]+1;'TIMEF'(I)+r2;'ANGA'('IFARAF'(I))+E;sto "CD"
53 (J-1)I[12]+r2;'ANGA'('IFARA'(I,J))+E
54
55 "CD":
56 E-(r2r4+'ANGA'('IFARA'(I,1)))+r6;if J=99;wrt 6.3,r2,E,r6-E,r6
57
58 "SUMS":
59 if Imod2=1;r6+r7+r7;r6+2+r9+r9;jmp 2
60 r6+r8+r8;r6+2+r10+r10

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1: next I
2:
3:
4: "fwd":
5: r7/DC11)+C:"PROFILE"(1,0,r2)+E:(4/DC11+2)(r27-r25)r2(r2-QC161)+G
6: r((r9-DC110+2)/(DC11-1))+S;r((r9+DC11(E+G)+2-2(E+G)r7)/DC11)+U
7:
8: "rev":
9: r8/DC21)+D:"PROFILE"(0,0,r2)+F:(4/DC11+2)(r28-r26)r2(r2-QC161)+H
10: r((r10-DC210+2)/(DC21-1))+T;r((r10+DC21(F+H)+2-2(F+H)r8)/DC21)+V
11: "PRINT":if flst=0;jmp 3
12: wrt 6.1,J;1e6r2,1e6C,1e6S,1e6E,1e6G,1e6(E+G),1e6(C-E-G),1e6U
13: wrt 6.2,J;1e6r2,1e6D,1e6T,1e6F,1e6H,1e6(F+H),1e6(D-F-H),1e6V;wrt 6
14:
15: "MAX RMS":
16: if abs(U)/abs(DC91);U+DC91;J+DC31;S+DC71;C-E-G+DC51;(J-1)IF121+DC111
17: if abs(V)/abs(DC101);V+DC101;J+DC41;T+DC81;D-F-H+DC61;(J-1)IF121+DC121
18:
19: "SkipSample":next J
20: if flst;for I=1 to 10;wrt 6.3,DC11;next I
21:
22: fwr 1.4;"repeatability based on";rc8;"worst case of RMS dev"
23: fwr 3.12;"no.scans",16x;"time",6x;"mean",5x;"sigma",7x;"RMS"
24: wrt 6.1,D#(r9-21);wrt 6.2
25: fwr 1.5x;c3,f12.0,f20.0,3f10.2
26: wrt 6.1,r#(11,DC11,1e6DC111,1e6DC51,1e6DC71,1e6DC91
27: wrt 6.1,r#(21,DC21,1e6DC121,1e6DC61,1e6DC81,1e6DC101
28:
29: trk 1;ldf 21
30: "SUBROUTINES":
31: "ANGA":can((2(p1-DC111)+DC131)/r(4DC121+2+DC131+2))+p2
32: ret p2-atn(.5DC131/DC121)
33: "IFARR":10+4p2-3+p3;if p1#1;2itf(W$(2p1-3,2p1-2))+4p2-3+p3
34: cmpitf(S$(p3+2,p3+3))+p4;cmpitf(S$(p3,p3+1))+p5
35: ret 2+16shf(p5,12)+2shf(p4,1)+shf(shf(p4,-15),15)-DC141
36: "IFARRAF":2(itf(W$(2p1-1,2p1))+3)-61+p2;if p1=I[6];p2+2+p2
37: cmpitf(S$(p2+2,p2+3))+p3;shf(shf(p3,-15),15)+2shf(p3,1)+p4
38: ret p4+2+16shf(cmpitf(S$(p2,p2+1)),12)-DC141
39: "PROFILE":3+21p2+p4;p4+10((p1+1)mod2)+1+p5;0+p6;for L=1 to P[p4]
40: p6+P[p5+L]p3+L+p6;next L;ret p6+P[p5]
41: "TIMEF":2(itf(W$(2p1-1,2p1))+5)-61+p2;if p1=I[6];p2+2+p2
42: cmpitf(S$(p2,p2+1))+p3;cmpitf(S$(p2+2,p2+3))+p4
43: 2shf(p4,1)+shf(shf(p4,-15),15)+2+16shf(shf(p3,-12),12)+p5
44: ret (p5-DC101)/QC51+I[11]
45: "STOIA":10+4p2-3+p4;if p1#1;2itf(W$(2p1-3,2p1-2))+4p2-3+p4
46: "stoid":p3+DC141+p7
47: shf(shf(cmpitf(S$(p4,p4+1)),4),4)+2+12int(p7/2+16)+p5
48: cll 'STORE'(p5,p4);2+16frc(p7/2+16)+p6;cll 'STORE'(p6,p4+2);ret
49: "STORE":if p1>2+15-1;p1-2+16+p1
50: fti (comp1)+S$(p2,p2+1);ret
51: "STOIAF":2(itf(W$(2p1-1,2p1))+3)-61+p3;if p1=I[6];p3+2+p3
52: cll 'stoid'(0,0,p2,p3);ret
#24257

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0: fwr 1;"alone(SAM;end cal)repeatability,3;tapeAT-PFM,tk1,file21,rev90380"
1: wrt 6.1
2: fwr 3;c3,f4.0,2x,2e15.8
3: fwr 1;"ALONE_SCAN_REPEATABILITY":

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1  dsw "Load Data Sheet 4.3.5-3(p83)" :sto
2  polrprt 705,"IP571,806,8177,10960"
3  scl 1:8.5,1:11:csiz 1.3,3:pen# 1
4  dsw "Align paper using Two Boxes"
5  plt 1.15,0.86,1:lbl ".":plt 7.48,10.04,1:lbl ".":plt 10,10,1:sto
6  dsw "Plotting" :r1:r2:if I[8]>50:I[8]/50+r2
7  for I=1 to 2:for J=0 to I[8] by r2
8  max(abs('PROFILE'(I,0,J[I[12]]),r1)+r1:next J:next I
9  1e6r1+r1:rnd(r1,1)+8:if r1>8:10+8+8
10 max(8,20)+8:if r37=1:5+8
11 scl -.1067Q[6],1.143Q[6],-1.637B,2.395B
12 fxd 0:fax 0,.25Q[6],0,Q[6]:fax 0,.5B,-B,B,4
13
14 "MEASURED/AVG":
15 for k=1 to 2:Kmod2+r15:I[6]+K+1
16 if K=1:pen# 1:line 1:plt .62Q[6],1.13B:plt .74Q[6],1.13B:pen:r23+r4
17 if K=2:pen# 3:line 1:plt .62Q[6],1.08B:plt .74Q[6],1.08B:pen:r24+r4
18 for J=1 to I[14]+1
19 if J=I[14]+1 and Q[69]=1:sto "SkipSamp1"
20 (J-1)I[12]+r2:'IFARA'(I,J)+r5:if J=I[14]+1:'TIMEF'(I)+r2:'IFARAF'(I)+r5
21 'ANGA'(r5)-(r2r4+'ANGA'('IFARA'(I,1)))+r6
22 r37=2:r6+(-4/Q[6]+2)r(28-r15)r2(r2-Q[6])+r6
23 'PROFILE'(K,0,r2)+r7
24 r7+(-4/Q[6]+2)r(26-r15)r2(r2-Q[6])+r7
25 r37=1:6-r7+r6
26 K=1:Q[6]-r2+r2
27 cll 'PLOT'(r2,1e6r6,30)
28 "SkipSamp1":next J:pen:next K
29
30 "SMOOTHED":if r37=1:sto "Label1"
31
32 for k=1 to 2:Kmod2+r15:I[6]+K+1
33 if K=1:pen# 4:line 3:plt .62Q[6],1.26B:plt .74Q[6],1.26B:pen:r23+r4
34 if K=2:pen# 2:line 2,2:plt .62Q[6],1.17B:plt .74Q[6],1.17B:pen:r24+r4
35 for J=1 to I[14]+1
36 if J=I[14]+1 and Q[69]=1:sto "SkipSamp2"
37 (J-1)I[12]+r2:'IFARA'(I,J)+r5:if J=I[14]+1:'TIMEF'(I)+r2:'IFARAF'(I)+r5
38 'ANGA'(r5)-(r2r4+'ANGA'('IFARA'(I,1)))+r6
39 'PROFILE'(K,0,r2)+r7
40 r7+(-4/Q[6]+2)r(26-r15)r2(r2-Q[6])+r7
41 if K=2:Q[6]-r2+r2
42 cll 'PLOT'(r2,1e6r7,45)
43 "SkipSamp2":next J:pen:next K
44
45 "Label1":scl 1:8.5,1:11:pen# 1
46 and 2:for K=1 to 2:plt 4.3,2.6-.3K,1
47 lbl 1e6D[K+10]
48 plt 5.1,2.6-.3K,1:lbl 1e6D[K+4], " ",1e6D[K+6], " ",1e6D[K+8]
49 next K
50 plt 7.7,2.1,1:if 1e6D[9]<1.75 and 1e6D[10]<1.75:lbl "P":jmp 2
51 lbl "F"
52 plt 2.1,9.5,1:lbl Q$[1,32]
53 plt 3.5,9.5,1:lbl Q$[33,35]
54 fxd 0:plt 5.3,9.5,1:lbl C[1]
55 plt 6.4,9.3,1:fxd 1:lbl Q[65], " ",Q[66], " ",Q[67]
56 if 'MODE'=0:plt 3.8,9.68,1:lbl "SAM MODE":if r36=0:lbl " (normal)"
57 if r36=1:lbl " (and calibrated)"
58 if r36=2:sto
59 if r36=3:sto
60 if r37=1:lbl " deviation profile"
61 fxd 1:plt 4.3,8.9,1:lbl Q[53], " ",Q[51], " ",Q[54], " ",Q[52], " "

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55: lbl Q[55], " ", Q[57], " ", Q[56], " ", Q[59], " ", Q[60]
56: plt 5.2, 8.6, 1: fxd 3: lbl 1e3C[2], " ", 1e3C[4]
57: plt 2.7, 9.1, 1: fxd 5: lbl C[5]
58: fxd 0: plt 3.9, 1: lbl C[9]-C[8]
59: for I=1 to 3: plt 2.9-.14I, 1: lbl C[9-I]; next I
70: plt 2.9-(4).14, 1: lbl C[10]
71: fxd 1: for I=1 to 3
72: plt 1.9, 7.7+.2(I-1), 1: lbl 1e5('ANGA'(r(29+I))- 'ANGA'(C[5+I]))
73: next I
74: for I=4 to 6
75: plt 3.4, 8.1-.2(I-4), 1: lbl 1e6('ANGA'(r(29+I))- 'ANGA'(C[12-I]))
76: next I
77: plt 3.4, 7.5, 1: lbl 1e6('ANGA'('IFARA'(I[6], 1))- 'ANGA'(C[6]))
78: plt 6.6, 7.5, 1: lbl "FWD": plt 7.6, 7.5, 1: lbl "REV"
79: plt 6.7, 3, 1: lbl "MIDSCAN OFFSET ANGLES, PHIf, PHIr": fxd 2
80: plt 6.7, 1, 1: lbl "mean": plt 6.5, 7.1, 1: lbl r17: plt 7.5, 7.1, 1: lbl r18
81: plt 6.6, 3, 1: lbl "sigma": plt 6.5, 6.9, 1: lbl r19: plt 7.5, 6.9, 1: lbl r20
82: plt 6.6, 7, 1: lbl "MIDSCAN GROUND CORRECTION"
83: plt 6.6, 5, 1: lbl "mean": plt 6.5, 6.5, 1: lbl r21: plt 7.5, 6.5, 1: lbl r22
84: plt 5.3, 3, 1: f1t 2: lbl Q[70], " TORR PRESSURE"
85: plt 5.3, 1, 1: fxd 2: if r0=8 or r0=9: jmp 2
86: lbl "MIDSCAN PRESSURE CORRECTION: ", 'PRESS'Q[70], " Grad"
87: csiz 1, 2: plt 6.8, 8.1, 1: fxd 4: lbl P[1]+P[2]/1e4: csiz 1, 3, 2
88: plt 5.3, 6, 1: lbl "data for smoothed profile: ", D[P[45]-3]
89: plt 5.3, 5, 1: lbl "data for measured/ave profile: ": lbl D[r0+1-3]
90: plt 1.5, 1.5, 1: fxd 4: lbl Q[11]+Q[21]/1e4
91: plt 2.1, 1.3, 1: fxd 0: lbl Q[36, 36], "--", Q[43, 44], " see ", Q[3]
92: plt 1.7, 1.95, 1: lbl "test no.", Q[43, 44], ", 19 FWD/19 REV SCAN, 75pts each"
93: plt 6.3, 1.6, 1: lbl Q[1]: pen#
94: if r36=1 and r37=0: 1+r37: dsp "press continue to plot derivation": end
95: dsp "finished": end
96: "SUBROUTINES":
97: "ANGA": ash((2(p1-C[11])+C[13])/r(4C[12]+2+C[13]+2))+p2
98: ret p2-atn(.5C[13]/C[12])
99: "IFARA": 10+4p2-3+p3: if p1#1: 2: itf(W[2p1-3, 2p1-2]+4p2-3+p3
100: cmpltf(S[p3+2, p3+3])+p4: cmpltf(S[p3, p3+1])+p5
101: ret 2+16shf(p5, 12)+2shf(p4, 1)+shf(shf(p4, -15), 15)-C[14]
102: "IFARAF": 2(itf(W[2p1-1, 2p1]+3)-61+p2): if p1=I[6]: p2+2+p2
103: cmpltf(S[p2+2, p2+3])+p3: shf(shf(p3, -15), 15)+2shf(p3, 1)+p4
104: ret p4+2+16shf(cmpltf(S[p2, p2+1]), 12)-C[14]
105: "PROFILE": 3+21p2+p4: p4+10((p1+1)mod2)+1+p5: 0+p6: for L=1 to P[p4]
106: p6+P[p5+L]: p3+L+p6: next L: ret p6+P[p5]
107: "TIMEF": 2(itf(W[3p1-1, 2p1]+5)-61+p2): if p1=I[6]: p2+2+p2
108: cmpltf(S[p2, p2+1])+p3: cmpltf(S[p2+2, p2+3])+p4
109: 2shf(p4, 1)+shf(shf(p4, -15), 15)+2+16shf(shf(p3, -12), 12)+p5
110: ret (p5-I[10])/Q[5]+I[11]
111: "MODE": c11 'TELE'(1, 2): ret bit(5, R)
112: "PLOT": if abs(p2)>28: pen: jmp 2
113: plt p1, p2
114: if f1: 1: wrt 6.2, "LINE " &str(p3), J, r2, r6
115: ret
116: "PRESS": ret itf(S[9, 10])/100
117: "TELE": 2: itf(W[2p1-1, 2p1]-34+p6): if p1=I[6]: p6+2+p6
118: 0+p9: for M=2 to 5: if pM=0: jmp 4
119: pM+2(pMmod2)-1+p11: itf(S[p6+p11-1, p6+p11])+p7: shf(shf(p7, -8), 8)+p7
120: 0+p8: for L=0 to 7: p8+2+(7-L)bit(L, p7)+p8: next L: p8+R
121: 256p9+p8+p9: next M
122: if 256+(M-2)/2-1<p9: p9-256+(M-2)+p9
123: p9+P[p9/5.3064375+p10+T]: ret p10
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Appendix B

Scan Mirror Assembly Acceptance Test Data

Workmanship Vibration

Test Report

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PRODUCT EVALUATION DEPARTMENT
ENVIRONMENTAL TEST SECTION

TEST REPORT

TEST REPORT NUMBER: 3907

WORKMANSHIP SINUSOIDAL VIBRATION

OF THE

THEMATIC MAPPER SCAN MIRROR ASSEMBLY (SMA)

REQUESTOR: Rubin Schreiner

ORG CODE: 77-31

PREPARED BY:

E Bursey

11 Feb 81

21222

DATE

EXT

CHECKED BY

JF Loer, Test Engr.

12 FEB 81

6907

DATE

EXT

APPROVED BY:

RJ Commiso

Head, Engr. Sect.

13 FEB 81

DATE

7478

EXT

REPORT SENT TO: Rubin Schreiner

BLDG: 5 M/S: R110

HUGHES AIRCRAFT COMPANY, CULVER CITY, CA 90230
ENVIRONMENTAL TEST LABORATORY, BLDG 21 M/S M114
TELEPHONE: (AREA CODE 213) 391-0711 EXT: 21222

HUGHES

TOTAL NO
OF PAGES

TEST REPORT SUMMARY
ENVIRONMENTAL TEST SECTION

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4

TR NUMBER: 3907

| PROGRAM: | TEST ITEM(S) | PART NUMBER(S) | S/N |
|----------------------------------|----------------------|----------------|-----|
| THEMATIC MAPPER | | | |
| ENVIRONMENT: SINUSOIDAL | SCAN MIRROR ASSEMBLY | 3533002-100 | 004 |
| TEST TYPE: WORKMANSHIP | | | |
| TEST START DATE: 23 January 1981 | | | |
| TEST END DATE: 23 January 1981 | | | |
| REQUESTOR: Rubin Schreiner | | | |

TEST REFERENCE:

The SCAN MIRROR ASSEMBLY (SMA) listed above was subjected to workmanship sinusoidal vibration in the 3 orthogonal axis. The desired vibration input for each axis was as shown in the enclosed Test Request. The actual vibration input is shown in the enclosed on-line computer plots. The test levels and the durations in each axis are described in the enclosed Vibration Test Log Sheet which contains a chronological description of the vibration.

The input vibration test levels were controlled on the power averaged signal of 4 accelerometers located on the vibration test fixture near the SMA attachment points as described in the enclosed Accelerometer Instrumentation Sheet.

During the test, the accelerometer signals were recorded on magnetic tape. The type of data and quantities taken are identified in the enclosed Data Summary. With the exceptions noted in the Data Summary comments, all data are included as part of this report.

The vibration test revealed no evidence of significant degradation.

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PRODUCT EVALUATION DEPARTMENT
ENVIRONMENTAL LABORATORY
VIBRATION TEST REQUEST

TEST REQUEST NO.

463

3907

☐ RENT FREE USE OF GOV'T. FACILITIES

☒ NO RENT FREE USE

COST ACCOUNT: E330-FAA-31

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|--|--|--|--|--|--|--|--|--|--|--|--|-----|---------------------------------------|---|----------------------------|----------------|--|-------------|--|----------|--|--|--|
| PROGRAM | | | | | | | | | | TEST ITEM | | | | | | | | | | S/N | | CLASSIFICATION | | | | TASK NO. | | | |
| T | H | E | M | A | T | | | | | P | | | | | | | | 004 | <input checked="" type="checkbox"/> U | <input type="checkbox"/> C | <input type="checkbox"/> S | | | | | | | | |
| REQUESTOR | | | | | | | | | | TEST TYPE | | | | | ENVIRONMENT | | | | | John F. Lee | | | | 21 Jan 1969 | | | | | |
| NAME Rubin Schreiner | | | | | | | | | | <input type="checkbox"/> QUAL
<input type="checkbox"/> ACCEPT
<input type="checkbox"/> EVAL
<input type="checkbox"/> REL
<input type="checkbox"/> BURN-IN
<input checked="" type="checkbox"/> VIBRATION | | | | | <input checked="" type="checkbox"/> SINE
<input type="checkbox"/> RANDOM
<input type="checkbox"/> S+R
<input type="checkbox"/> SNBR
<input type="checkbox"/> GUNFIRE | | | | | TEST ENGINEER | | | | DATE | | | | | |
| ORG CODE 7731 | | | | | | | | | | | | | | | | | | | | GROUP/SECTION HEAD | | | | DATE | | | | | |
| VS Bldg 5/3112 EXT 6687/3609 | | | | | | | | | | | | | | | | | | | | TEST OPERATIONS | | | | DATE | | | | | |
| CONTROL | | | | | | | | | | METHOD: <input type="checkbox"/> SINGLE POINT <input checked="" type="checkbox"/> SIG SELECT | | | | | ACCEL'S | | | | | <input type="checkbox"/> PWR AVG | | | | ACCEL'S | | | | | |
| RECORDING: <input checked="" type="checkbox"/> LAB STANDARD <input type="checkbox"/> OTHER | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MONITOR ACCELS. | | | | | | | | | | NO. TYPE | | | | | RECORD ON <input type="checkbox"/> TAPE, <input type="checkbox"/> OSCILLOGRAPH, <input type="checkbox"/> OTHER | | | | | MONITOR LOCATIONS: | | | | | | | | | |
| | | | | | | | | | | None | | | | | | | | | | <input type="checkbox"/> ATTACHED | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | <input type="checkbox"/> SPECIFIED BY | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | TESTS ENGR. | | | | | | | | | |
| TEST DESCRIPTION | | | | | | | | | | ADDITIONAL INSTRUCTIONS ATTACHED <input type="checkbox"/> | | | | | | | | | | PHOTOS REQUIRED <input checked="" type="checkbox"/> | | | | | | | | | |

WORKMANSHIP VIBRATION - SINE

To be performed with the Scan Mirror Ass'y (SMA) mounted as shown in Figure 3-1 and with four (4) accelerometers mounted near the four corners of the Window Frame Fixture. Vibration input as monitored by the control accelerometers, shall be - $\frac{1}{2}$ g sine sweep from 10 to 2000 Hz at two (2) octaves per minute. Tests may be performed in any sequence of axes desired. Axis definition is shown on Figure 3-1 attached. Perform test in all three (3) orthogonal axes.

PN 3533002-100 S/N 004

C-6

TR 3907

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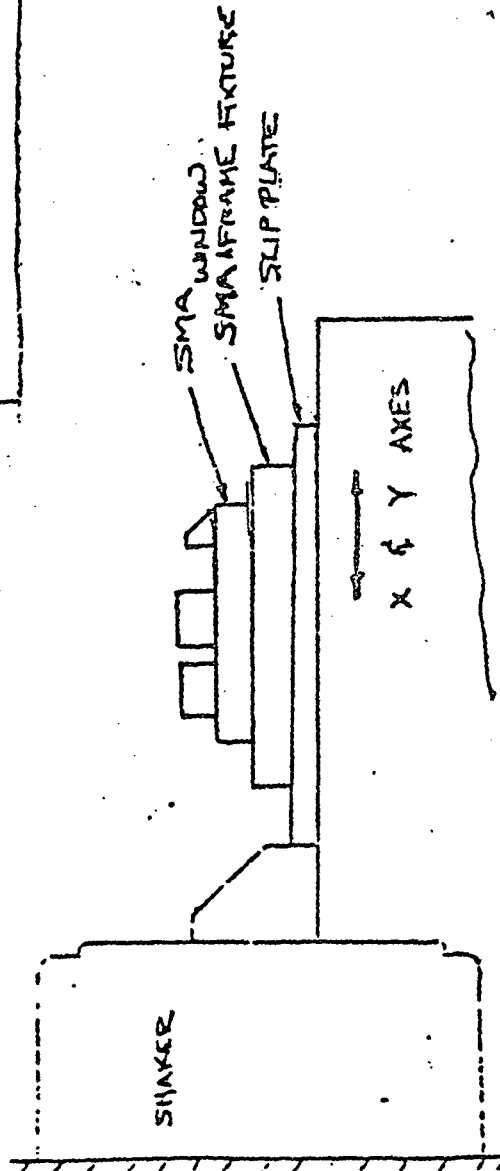
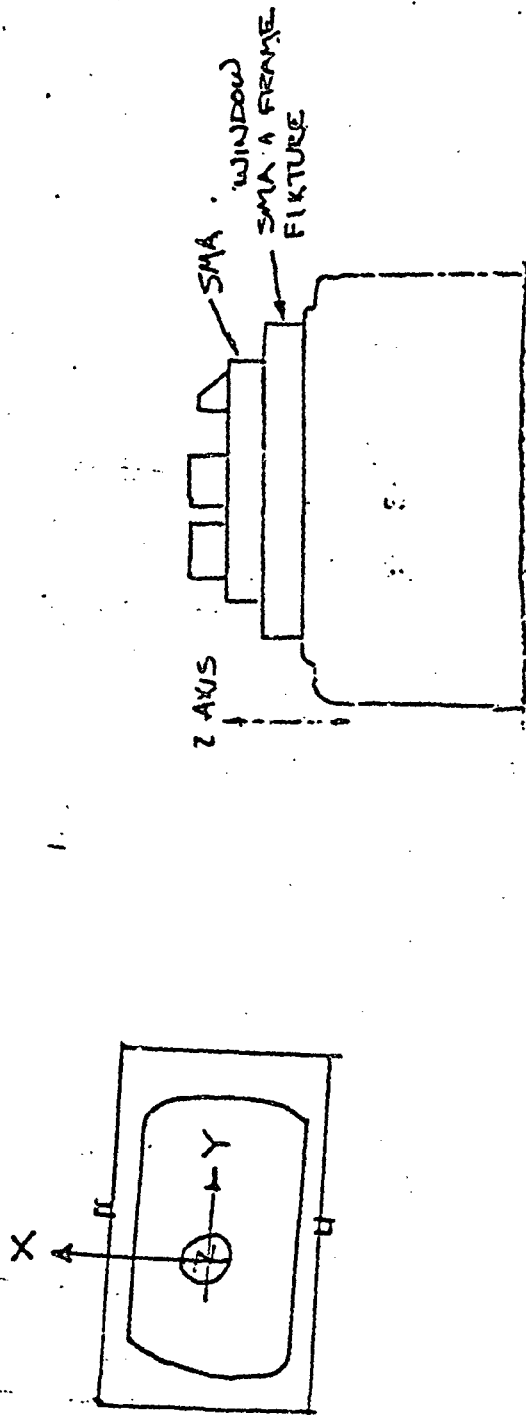


Fig 3-1

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ENVIRONMENTAL DATA SUMMARY
ENVIRONMENTAL TEST SECTION

TR Page

465

PROGRAM: *THEM. MAP*

TR NUMBER: *3907*

| TYPE OF DATA | QUANTITY
TAKEN | COMMENTS |
|---|-------------------|-------------------------------|
| Circular Chart, Altitude | | |
| Circular Chart, Dry Bulb Temperature | | |
| Circular Chart, Wet Bulb Temperature | | |
| Circular Chart, | | |
| Data Sheets, Airflow | | |
| Data Sheets, | | |
| Pages, Accelerometer/Instrumentation | <i>1</i> | |
| Pages, ATP Operations Report | | |
| Pages, Test Log, | <i>1</i> | |
| Pages, Thermocouple/Instrumentation | | |
| Pages, TDAS Tabulation | | |
| Photographs, Accelerometer Locations | | |
| Photographs, Shock Pulse | | |
| Photographs, Test Setup | | |
| Photographs, Thermocouple Locations | | |
| Photographs, | <i>2</i> | |
| Photographs for Test Engineer File | | Maintained in Laboratory |
| Plots, ASD (G^2/Hz vs Hz) Test | | |
| Plots, ASD (Dry Run/Buyoff) | | |
| Plots, Delta Pressure | | |
| Plots, Pressure vs Time | | |
| Plots, Temperature vs Time | | |
| Plots, Sine Vibration (G-pk vs Hz) | | |
| Plots, Computer | <i>5</i> | |
| Reels, Magnetic Tape ($\frac{1}{2}$ inch wide) | <i>1</i> | Maintained in Lab for 30 Days |
| Reels, Magnetic Tape (1 inch wide) | | Maintained in Lab for 30 Days |
| Rolls, Strip Chart (Altitude)* | | |
| Rolls, Strip Chart (Temperature)* | | |
| Rolls, Visicorder (6 inch wide)* | | |
| Rolls, Visicorder (12 inch wide)* | | |
| Lists, Test Equipment | <i>1</i> | |
| | | |
| | | |
| | | |
| | | |

* Mailed Separately Unless Otherwise
Noted in Comments

TEST SUPERVISOR:

J. mullen

HUGHES AIRCRAFT COMPANY, CULVER CITY, CA 90230, PHONE: 391-0711
ENVIRONMENTAL TEST LABORATORY, BUILDING 21, M/S M114 EXT: 21222

HUGHES

ACCELEROMETER INSTRUMENTATION SHEET

ENVIRONMENTAL TEST SECTION

TR Page

ACCELEROMETER INSTRUMENTATION SHEET

TR NUMBER 3907
ACCEL SHEET of

| | |
|-------------------|------------|
| PROGRAM | THEM MAP |
| TEST ITEM | SMA MAPPER |
| DATE | 12/1/81 |
| TYPE OF VIBRATION | RANDOM |

TEST

SHAKER SYSTEM 249
CONTROL STATION C
P.B. NUMBER

COMMENTS/NOTES

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**ACCELEROMETERS TAPE TRACK
AND/OR VISICORDER CHANNEL**

Cx Controls
Mx Monitors
RCx Response Controls
A Auxiliary Control
H Head

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VIBRATION TEST LOG SHEET
ENVIRONMENTAL TEST SECTION

TR Page _____

[illegible]

RELATED TR(s):

ORIGINAL PAGE 18
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ENVIRONMENTAL TEST EQUIPMENT
ENVIRONMENTAL TEST SECTION

TR Page 46



PROGRAM:

TR NUMBER: 3907

The following test equipments were used to conduct the environmental tests. All measurements and readings were made with instruments whose accuracy was verified by periodic calibration per individual specification listed in the Hughes Master Index (30757-01). All calibration standards are traceable to the United States Bureau of Standards.

VIBRATION SYSTEMS

- ☒ 120-04625: LING, 249 (28,000 FP)
- ☐ G-111434 : UD, T-1000 (15,000 FP)
- ☐ H-368672 : UD, T-4000 (36,000 FP)
- ☐ H-41024 : MB ELECT, C-70 (7000 FP)
- ☐ H-901819 : LING, 177 (5000 FP)

RANDOM EQUALIZER/ANALYZER SYSTEM

- ☐ H-210996: LING, ASDE-80
- ☐ H-207130: LING, ASDE-40

OSCILLOSCOPES

- ☐ H-192878: HEWLETT PACKARD, 1206AR
- ☐ H-193019: HEWLETT PACKARD, 1206AR
- ☐ H-211488: HEWLETT PACKARD, 120B
- ☐ H-211489: HEWLETT PACKARD, 120B
- ☐ H-211490: HEWLETT PACKARD, 120B
- ☐ H-211491: HEWLETT PACKARD, 120B
- ☐ H-197108: HEWLETT PACKARD, 120B

TRUE RMS VOLTMETERS

- ☐ H-182693: HEWLETT PACKARD, 3400A
- ☐ H-182694: HEWLETT PACKARD, 320A
- ☐ H-186774: HEWLETT PACKARD, 3400A
- ☐ H-186775: HEWLETT PACKARD, 3400A
- ☐ H-186776: HEWLETT PACKARD, 3400A
- ☐ H-186777: HEWLETT PACKARD, 3400A
- ☐ H-193016: HEWLETT PACKARD, 3400A
- ☐ H-193017: HEWLETT PACKARD, 3400A
- ☐ H-193018: HEWLETT PACKARD, 3400A
- ☐ H-196916: HEWLETT PACKARD, 3400A
- ☐ H-196917: HEWLETT PACKARD, 3400A
- ☐ H-196918: HEWLETT PACKARD, 3400A

MAGNETIC TAPE RECORDERS

- ☐ 120-04922: SANDBORNE, 2000 (7 Tracks)
- ☒ 120-05182: AMPEX, FR1200 (7 Tracks)
- ☐ G-005667 : AMPEX, FR1800 (14 Tracks)
- ☐ H-182484 : AMPEX, FR1300 (14 Tracks)
- ☐ E-357900 : Honeywell 9500 (14 Tracks)

VISICORDERS/OSCILLOGRAPHS

- ☐ H340086: HONEYWELL, 1858 (8")
- ☐ E360689 : HONEYWELL, 1912 (12")
- ☐ H-103491 : HONEYWELL, 906C (6")
- ☐ H-181652 : HONEYWELL, 1612 (12")

SINE SERVO SYSTEMS

- ☐ G-111434: UNHOLTZ DICKIE, SP
- ☐ H-220366: LING ELECTRONICS

HP DIGITAL CONTROL S= SINE R= RAND

- ☒ E-359666 HP 5127
- ☐ E-360625 HP 5151

X-Y PLOTTER/RECORDER

- ☐ 120-05170: F.L. MOSELEY, 135
- ☐ H-182203 : F.L. MOSELEY, 2B3
- ☐ H-193096 : HEWLETT PACKARD, 7035B
- ☐ H-209942 : F.L. MOSELEY, 135

LOG CONVERTERS

- ☐ G-301397: F.L. MOSELEY, 60D
- ☐ H-182259: F.L. MOSELEY, 60D
- ☐ H-185267: F.L. MOSELEY, 60D
- ☐ H-185268: F.L. MOSELEY, 60D
- ☐ 101: HUGHES AIRCRAFT
- ☐ 102: HUGHES AIRCRAFT
- ☐ 103: HUGHES AIRCRAFT
- ☐ 104: HUGHES AIRCRAFT

STROBE LIGHTS

- ☐ H-315497: CHADWICK HELMUTH, 109

| CONTROL STATION | G LEVEL LIMITER | GUNFIRE SIMULATOR |
|-----------------|-----------------|-------------------|
| B | 2 | 101 |
| C | 3 | 102 |
| D | 101 | |
| E | 102 | |
| F | 103 | |
| | | SNR CONSOLE |
| | | 1 |
| | | 2 |

OTHER EQUIPMENT USED:

PREPARED BY:

DATE:

ED SELLER

1-23-81

HUGHES AIRCRAFT COMPANY, CULVER CITY, CA 90230, PHONE: 391-0711
ENVIRONMENTAL TEST LABORATORY, BUILDING 21, M/S M114 EXT: 21222

HUGHES

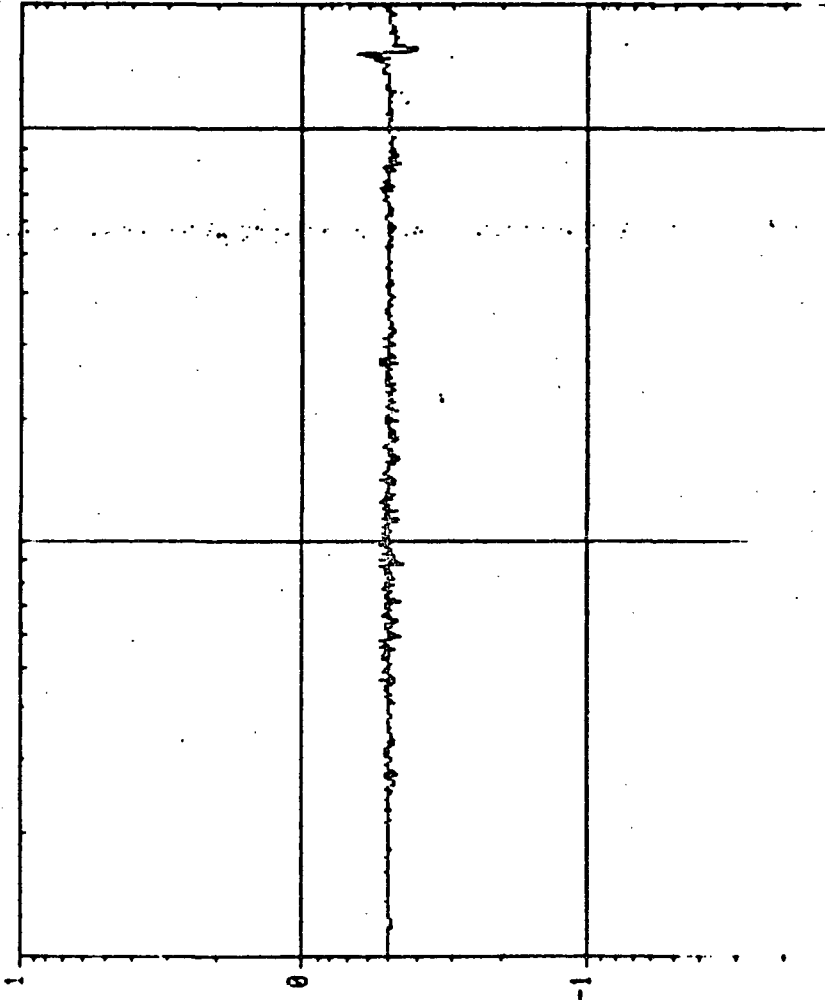
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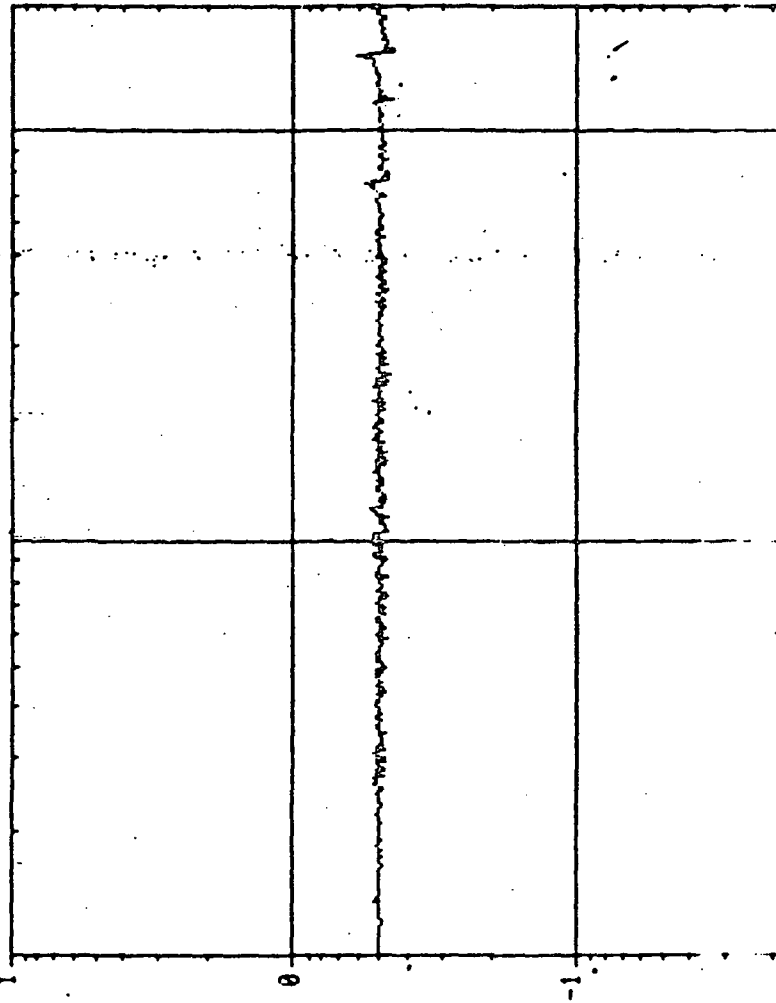
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DPY RUN 1-23-81 TR3307
CONTROL: POST TEST
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SWEEP 9 1 UP

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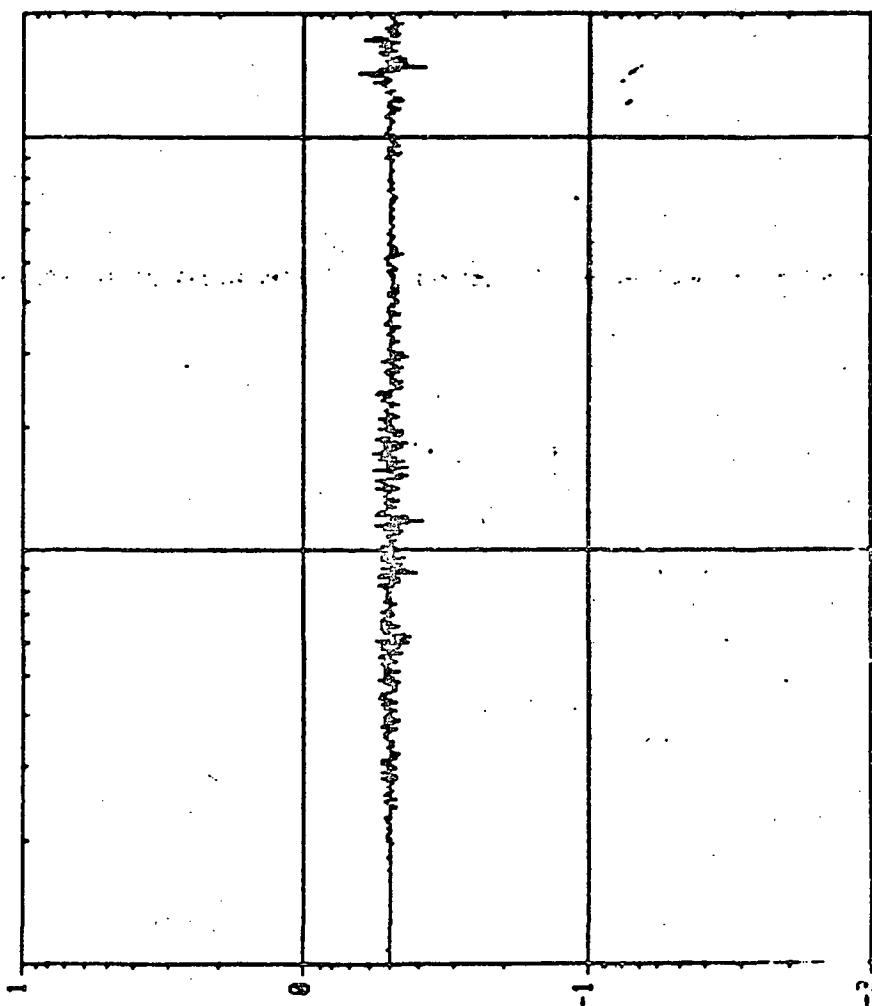
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DD: RUN DATE 1-23-81 TR3987
CONTROL: POST TEST
6 SWEEP 8 1 UP

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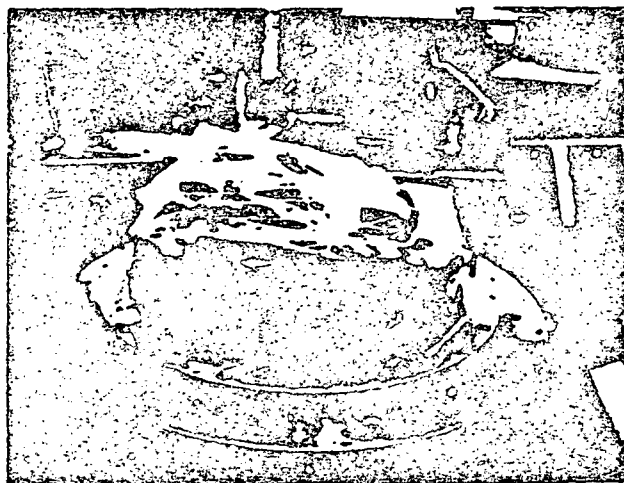
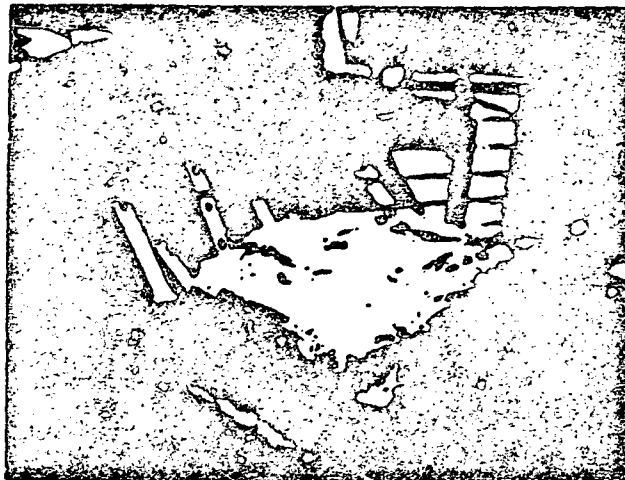
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TR No. 3907

TR Page: _____

Program: THEM. MAP

Test Item: SMA

Axis: X

Date: 1-23-81

Test Item: SMA

Axis: Z

Date: 1-23-81

Test Item: _____

Axis: _____

Date: _____

Appendix B

Scan Mirror Assembly Acceptance Test Data

Thermal Test Report

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PRODUCT EVALUATION DEPARTMENT
ENVIRONMENTAL TEST SECTION

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TEST REPORT

TEST REPORT NUMBER: 3908

WORKMANSHIP TEMPERATURE SOAK

OF THE

THEMATIC MAPPER SCAN MIRROR ASSEMBLY (TMA)

REQUESTOR: Rubin Schreiner

ORG CODE: 77-31

PREPARED BY:

E Fursey

16 Feb 81

21222

DATE

EXT

CHECKED BY:

[Signature]
P Loef, Test Engr.

17 FEB 81

DATE

6207

EXT

APPROVED BY:

[Signature]
R.J. Commiso
Head, Engr. Sect.

18 FEB 81

DATE

7478

EXT

REPORT SENT TO: Rubin Schreiner

BLDG: 5 M/S: B110

HUGHES AIRCRAFT COMPANY, CULVER CITY, CA 90230
ENVIRONMENTAL TEST LABORATORY, BLDG 21 M/S M114
TELEPHONE: (AREA CODE 213) 391-0711 EXT: 21222

HUGHES

TOTAL NO
OF PAGES

**TEST REPORT SUMMARY
ENVIRONMENTAL TEST SECTION**

476

TR NUMBER: 3908

| PROGRAM: | TEST ITEM(S) | PART NUMBER(S) | S/N |
|----------------------------------|----------------------------|----------------|-----|
| THEMATIC MAPPER | | | |
| ENVIRONMENT: TEMPERATURE SOAK | | | |
| TEST TYPE: WORKMANSHIP | SCAN MIRROR ASSEMBLY (SMA) | 3533002-100 | 004 |
| TEST START DATE: 27 January 1981 | | | |
| TEST END DATE: 28 January 1981 | | | |
| REQUESTOR: Rubin Schreiner | | | |

TEST REFERENCE:

The SCAN MIRROR ASSEMBLY (SMA) was subjected to workmanship temperature soak conditions. The desired temperature test is described in the enclosed Test Request. The actual temperature levels and durations are described in the enclosed Temperature Log Sheets which contain a chronological description of the test.

Temperature conditions were controlled by 1 thermocouple located in the chamber. Seven (7) thermocouples were used to monitor temperatures during the test. Thermocouple readings were taken during the test and temperature tabulations are enclosed. Thermocouple locations are described in the enclosed Thermocouple Information Sheet.

All data taken during the test are included as part of this test report.

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PRODUCT EVALUATION DEPARTMENT
ENVIRONMENTAL LABORATORY
CLIMATICS AND THERMAL VACUUM TEST REQUEST

TEST REQUEST 477
3 9 0

TEST FREE USE OF GOV FACILITIES
NO RENT FREE USE

COST ACCOUNT E330 - FAA - 31

| PROGRAM | TEST ITEM | S/N | CLASSIFICATION | TASK NO. |
|-------------------|-----------|-----|----------------|----------|
| T H E M A T M A P | S M A | 004 | BU C S | |

| | | | |
|-----------------------------------|---|---|--|
| REQUESTOR
NAME Rabin Schreiner | TEST TYPE
<input type="checkbox"/> QUAL
<input type="checkbox"/> ACCEPT
<input type="checkbox"/> EVAL
<input type="checkbox"/> REL
<input type="checkbox"/> BURN-IN
<input checked="" type="checkbox"/> WORKMANSHIP | ENVIRONMENT
<input checked="" type="checkbox"/> TEMP SOAK
<input type="checkbox"/> TEMP/ALT
<input type="checkbox"/> HUMIDITY
<input type="checkbox"/> THER VAC | John P. Loef
TEST ENGINEER
DATE 22 Jan 198 |
| ORG CODE 7731 | M/S: EIDE 5/E120 EXT 667/3605 | APPROVED
GROUP/SECTION HEAD
TEST OPERATIONS | DATE 22 Jan 198 |

TEMP CONTROL METHOD: ☐ CHAMBER CONTROL ☒ CONTROL T/C LOCATED R.E.A. direction

TEST ITEM COOLING: ☐ AIR ☐ LIQUID SPECIFIED: Dry Nitrogen

MONITOR THERMOCOUPLE REQUIREMENTS: 7 THERMOCOUPLES LOCATED: ☐ IN ATTACHMENT ☒ SPECIFIED BY TEST ENG

RECORD T/C READINGS ON: ☐ STRIP CHART RECORDER ☒ TDAS

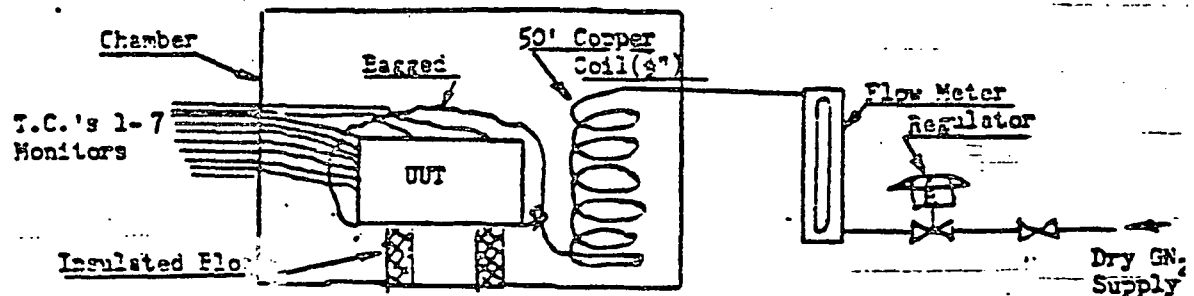
TEMP STABILIZATION: ☒ LAB STANDARD (2° C HOUR) OTHER

TEST DESCRIPTION: ADDITIONAL INSTRUCTIONS ATTACHED ☐ PHOTOS REQUIRED

WORKMANSHIP TEMPERATURE SOAK P/N 3533002-100

Place the bagged Scan Mirror Ass'y (SMA) unit in a temperature chamber.

Install seven (7) thermocouples as designated by the R.E.A. Record these monitor T.C.'s every five minutes or oftener during the test. Connect a dry nitrogen line to the bag as shown in the schematic below:



Purge bagged unit with dry GN₂ and set the flow at approximately 2-3 CFM to maintain a slight positive pressure. This flow will be adjusted to maintain a uniform temperature distribution during the test. Condition chamber air to -10°C (+14°F). The R.E.A. will direct small changes in this setting as required. Soak unit for two (2) hours. Repeat with temperature at +40°C (+104°F)

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ENVIRONMENTAL DATA SUMMARY
ENVIRONMENTAL TEST SECTION

TR Page 478

PROGRAM: *THEMATIC MAPPER*

TR NUMBER: *3908*

| TYPE OF DATA | QUANTITY
TAKEN | COMMENTS |
|---|-------------------|-----------------------------------|
| Circular Chart, Altitude | | |
| Circular Chart, Dry Bulb Temperature | | |
| Circular Chart, Wet Bulb Temperature | | |
| Circular Chart, | | |
| Data Sheets, Airflow | | |
| Data Sheets, | | |
| Pages, Accelerometer/Instrumentation | | |
| Pages, ATP Operations Report | | |
| Pages, Test Log, | <i>2</i> | |
| Pages, Thermocouple/Instrumentation | <i>1</i> | |
| Pages, TDAS Tabulation | <i>4</i> | |
| Photographs, Accelerometer Locations | | |
| Photographs, Shock Pulse | | |
| Photographs, Test Setup | <i>2</i> | |
| Photographs, Thermocouple Locations | | |
| Photographs, | | |
| Photographs for Test Engineer File | | Maintained in Laboratory |
| Plots, ASD (G^2/Hz vs Hz) Test | | |
| Plots, ASD (Dry Run/Buyoff) | | |
| Plots, Delta Pressure | | |
| Plots, Pressure vs Time | | |
| Plots, Temperature vs Time | | |
| Plots, Sine Vibration (G-pk vs Hz) | | |
| Plots, | | |
| Reels, Magnetic Tape ($\frac{1}{2}$ inch wide) | | Maintained in Lab for 30 Days |
| Reels, Magnetic Tape (1 inch wide) | | Maintained in Lab for 30 Days |
| Rolls, Strip Chart (Altitude)* | | |
| Rolls, Strip Chart (Temperature)* | | |
| Rolls, Visicorder (6 inch wide)* | | |
| Rolls, Visicorder (12 inch wide)* | | |
| Lists, Test Equipment | <i>1</i> | |
| | | |
| | | |
| | | |
| * Mailed Separately Unless Otherwise
Noted in Comments | | TEST SUPERVISOR: <i>J E James</i> |
| HUGHES AIRCRAFT COMPANY, CULVER CITY, CA 90230, PHONE: 391-0711 | | |
| ENVIRONMENTAL TEST LABORATORY, BUILDING 21, M/S MM14 EXT: 21222 | | |
| HUGHES | | |

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THERMOCOUPLE INSTRUMENTATION SHEET
ENVIRONMENTAL TEST SECTION

TR Page

479

THERMOCOUPLE INSTRUMENTATION SHEET

TR NUMBER: 3908

PROGRAM THE MAT MAP

TEST ITEM SMA

DATE JAN-27-81

CHAMBER C-6

T/C SHEET 1 of 1

| BANK | CHANNEL | THERMOCOUPLE LOCATION | | | | | | | | | | FUNCTION | | | | | RECORDED ON | | | | | Remote Display |
|------|---------|-----------------------|-------|--------|-------|--------|-------|-------|--------|-------|--------|----------|---------|-----------|------|-------------|-------------|------------|--|--|--|----------------|
| | | INLET | FRAME | HANDLE | FRAME | HANDLE | INLET | FRAME | HANDLE | FRAME | HANDLE | Control | Monitor | Stabilize | TDAS | Strip Chart | Chart | Data Sheet | | | | |
| 11 | 1 | INLET | FRAME | HANDLE | FRAME | HANDLE | INLET | FRAME | HANDLE | FRAME | HANDLE | X | X | | | | | | | | | |
| 11 | 2 | INLET | FRAME | HANDLE | FRAME | HANDLE | INLET | FRAME | HANDLE | FRAME | HANDLE | X | X | | | | | | | | | |
| 11 | 3 | INLET | FRAME | HANDLE | FRAME | HANDLE | INLET | FRAME | HANDLE | FRAME | HANDLE | X | X | | | | | | | | | |
| 11 | 4 | INLET | FRAME | HANDLE | FRAME | HANDLE | INLET | FRAME | HANDLE | FRAME | HANDLE | X | X | | | | | | | | | |
| 11 | 5 | INLET | FRAME | HANDLE | FRAME | HANDLE | INLET | FRAME | HANDLE | FRAME | HANDLE | X | X | | | | | | | | | |
| 11 | 6 | INLET | FRAME | HANDLE | FRAME | HANDLE | INLET | FRAME | HANDLE | FRAME | HANDLE | X | X | | | | | | | | | |
| 11 | 7 | INLET | FRAME | HANDLE | FRAME | HANDLE | INLET | FRAME | HANDLE | FRAME | HANDLE | X | X | | | | | | | | | |
| 11 | 8 | INLET | FRAME | HANDLE | FRAME | HANDLE | INLET | FRAME | HANDLE | FRAME | HANDLE | X | X | | | | | | | | | |

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CLIMATICS TEST LOG SHEET
ENVIRONMENTAL TEST SECTION

TR Page

480

TR NUMBER 3908
LOG SHEET 1 of 2

| PROGRAM | | Thematic Mapper | |
|--------------|--|--------------------------|--|
| C/A NUMBER | | E330 - FAA - 31 | |
| TEST ENGR | | John Loop | |
| TEST PURPOSE | | Workmanship Thermal Soak | |
| EXT | | 6907 -21222 | |

| RECEIVED BY: | | DATE: | |
|--|--|-------|--|
| DATA GIVEN TO REQUESTOR AND NOT INCLUDED WITH THE TEST REPORT: | | | |

| ID | TEST ITEM(s) | PART NUMBER(s) | S/N | REFERENCE DOCUMENTS(s): | CHAMBER | ALTIMETER | PROBLEM | COMMENTS & NOTES | ENTRY BY |
|----|------------------------|----------------|-----|-------------------------|---------|-----------|---------|---------------------------------|----------|
| A | Scan Mirror Assy (SMA) | 3539002-100 | 004 | | | | | START CHAMBER FROM 74°F TO +5°F | 64 |
| | | | | | | | | ECAM #1 (100/HR) | |
| | | | | | | | | AT FLAM W HOLD UNIT | |
| | | | | | | | | CHAMBER AT +8°F PER REA. | 1C |
| | | | | | | | | CHAMBER TO +10°F | 1C |
| | | | | | | | | START RETURN TO 75°F | 44 |
| | | | | | | | | ALL TIES AT AMBIENT | |
| | | | | | | | | SHUT OFF PURGE AND CHAMBER | 1C |
| | | | | | | | | START CHAMBER TO +110°F PER REA | 1C |
| | | | | | | | | HOLD AT +109°F PER REA | 1C |
| | | | | | | | | CHAMBER TO +107°F | 1C |

PROGRAM: Thematic Mapper

U. S. BANK 3908

THE END

CONCEPTS & POINTS

Return To Ambient

2

PROBLY
PRESS
20
ALITY

TEST ITEM

ET ITEM
ELECTION
TREATIES

CONTROL
TEST

CONTROL INSTRUCTIONS

100

| START | TIME |
|-------|------|
|-------|------|

| | |
|------|--------|
| TEST | DATE |
| ITEM | 1981 |
| ID | DAVAMO |

A 28 JAN 1370

75
A.R.

Gibz Puz

5.

Return To Ambient

2

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482

ENVIRONMENTAL TEST EQUIPMENT
ENVIRONMENTAL TEST SECTION

TR Page _____

PROGRAM: THEMATIC MAPPER

TR NUMBER: 3908

The following test equipments were used to conduct the environmental tests. All measurements and readings were made with instruments whose accuracy was verified by periodic calibration per individual specification listed in the Hughes Master Index (30737-01). All calibration standards are traceable to the United States Bureau of Standards.

TEST CHAMBER

| | |
|--------------------------------------|---|
| — G-112371 : CONRAD, 4'x4'x3' (C-3) | — 120-02593 : CONRAD, 2'x2'x2½' (C-9) |
| — H-374480 : THERMO, 4'x4'x6' (C-4) | — G-112302 : BEMCO, 6'x6'x6' (C-11) AGREE |
| — H-376265 : THERMO, 4'x4'x6' (C-5) | — 820-00727 : BEMCO, 8'x8'x8' (C-12) |
| X G-112112 : BEMCO, 6'x6'x6' (C-6) | — H-065224 : GVC, 22"D x 24"L (HI VAC 2) |
| — G-112111 : BEMCO, 7'x8'x18' (C-7) | — H-204767 : GVC, 29"D x 48"L (HI VAC 4) |
| — H-043034 : HYEATT, 7'x7'x18' (C-8) | |

| EQUIPMENT | ID NUMBER
(IF USED) | EQUIPMENT | ID NUMBER
(IF USED) |
|-----------------------------------|------------------------|--------------------------------|------------------------|
| Controller, Chamber Altitude | | Air Supply, Blower | |
| Controller, Chamber Dry Bulb | F761022 | Air Heat Exchanger | |
| Controller, Chamber Wet Bulb | | Air Supply/Heat Exchanger Cart | |
| Controller, Shroud/Plate Temp | | Liquid Conditioning Cart | |
| Controller, Temperature | | | |
| Digital Display, Temp (Remote) | ADW5 | Laminar Flow Element | |
| Digital Indicator, Altitude | | Flourator | F932157 |
| Digital Thermometer, Chamber | | | |
| Digital Thermometer, Shroud/Plate | | Manometer, Mercury | |
| Digital Thermometer, TDAS | F761015 | Manometer, Water | |
| Thermal Data Acquisition System | G112113 | | |
| Recorder, Altitude | | | |
| Recorder, Dry Bulb Temperature | | | |
| Recorder, Wet Bulb Temperature | | | |
| Recorder, Temperature | | | |
| Ionization Gauge Control | | | |
| Pressure Gauge | | | |
| Pressure Transducer | | | |
| Potentiometer (Temperature) | | | |

COMMENTS

PREPARED BY: J. E. Jones DATE: 6 FEB 81

HUGHES AIRCRAFT COMPANY, CULVER CITY, CA 90230, PHONE: 391-0711
ENVIRONMENTAL TEST LABORATORY, BUILDING 21, M/S M114 EXT: 21222

HUGHES

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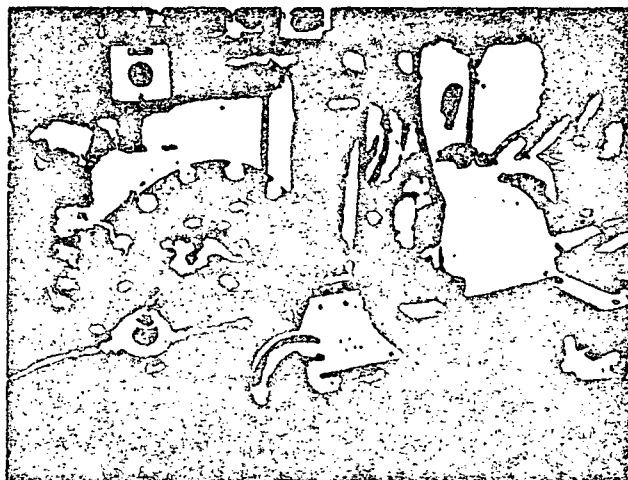
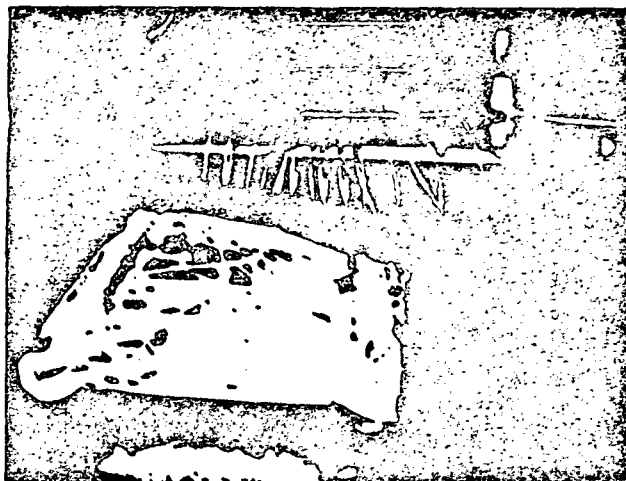
483

TR No. 2708

TR Page: _____

Program: THEMAT M

Test Item: SMA



Test Item: SMA

Test Item: _____

PAGE NO. 1

INTERNAL TEST DATA

PROJECT: THEMAT MAP
UNIT: SMA START DATE: 27 JAN 1968
TEST: 3908
COMMENTS:

HUGHES AIRCRAFT COMPANY
ENVIRONMENTAL TEST DEPT

TEMPERATURE-DEGREES F

RECORD START HXCHM - 11101 11102 11103 11104 11105 11106 11107 11108 11109 11110 11111 11112 11113 11114 11115

| | | | | | | | | | | | | | | |
|--------|----------|----|----|----|----|----|----|----|----|----|----|----|----|----|
| JAN 27 | 11109116 | 79 | 74 | 74 | 75 | 74 | 74 | 75 | | | | | | |
| JAN 27 | 11114145 | 72 | 73 | 74 | 74 | 74 | 74 | 74 | 75 | 74 | 75 | 75 | 75 | 75 |
| JAN 27 | 11120116 | 67 | 70 | 72 | 73 | 72 | 73 | 72 | 73 | 72 | 73 | 72 | 73 | 72 |
| JAN 27 | 11125146 | 64 | 67 | 70 | 72 | 70 | 72 | 70 | 72 | 70 | 72 | 70 | 72 | 70 |
| JAN 27 | 11131117 | 61 | 63 | 63 | 69 | 68 | 69 | 68 | 69 | 68 | 69 | 68 | 69 | 68 |
| JAN 27 | 11136147 | 57 | 59 | 58 | 67 | 66 | 67 | 66 | 67 | 66 | 67 | 66 | 67 | 66 |
| JAN 27 | 11142118 | 55 | 56 | 57 | 65 | 63 | 65 | 63 | 65 | 63 | 65 | 63 | 65 | 63 |
| JAN 27 | 11147147 | 52 | 54 | 55 | 63 | 61 | 63 | 61 | 63 | 61 | 63 | 61 | 63 | 61 |
| JAN 27 | 11153110 | 51 | 52 | 53 | 61 | 59 | 61 | 59 | 61 | 59 | 61 | 59 | 61 | 59 |
| JAN 27 | 11158148 | 49 | 50 | 51 | 59 | 57 | 59 | 57 | 59 | 57 | 59 | 57 | 59 | 57 |
| JAN 27 | 12104119 | 48 | 49 | 50 | 57 | 56 | 57 | 56 | 57 | 56 | 57 | 56 | 57 | 56 |
| JAN 27 | 12109149 | 47 | 48 | 49 | 56 | 54 | 56 | 54 | 56 | 54 | 56 | 54 | 56 | 54 |
| JAN 27 | 12115120 | 47 | 48 | 49 | 53 | 53 | 53 | 52 | 53 | 52 | 53 | 52 | 53 | 52 |
| JAN 27 | 12120149 | 47 | 47 | 48 | 53 | 53 | 53 | 52 | 53 | 51 | 52 | 51 | 52 | 51 |
| JAN 27 | 12126120 | 46 | 47 | 47 | 52 | 51 | 52 | 51 | 52 | 50 | 51 | 50 | 51 | 50 |
| JAN 27 | 12131150 | 45 | 46 | 46 | 51 | 50 | 51 | 50 | 51 | 49 | 50 | 49 | 50 | 49 |
| JAN 27 | 12137121 | 44 | 44 | 45 | 50 | 48 | 50 | 48 | 50 | 47 | 48 | 47 | 48 | 47 |
| JAN 27 | 12142151 | 42 | 43 | 40 | 40 | 40 | 47 | 46 | 47 | 46 | 47 | 46 | 47 | 46 |
| JAN 27 | 12148122 | 41 | 42 | 42 | 47 | 46 | 47 | 46 | 47 | 45 | 46 | 45 | 46 | 45 |
| JAN 27 | 12153152 | 39 | 40 | 40 | 46 | 45 | 46 | 45 | 46 | 44 | 45 | 44 | 45 | 44 |
| JAN 27 | 12159123 | 38 | 39 | 39 | 44 | 43 | 44 | 43 | 44 | 42 | 43 | 42 | 43 | 42 |
| JAN 27 | 13104153 | 36 | 37 | 38 | 44 | 42 | 44 | 42 | 44 | 41 | 42 | 41 | 42 | 41 |
| JAN 27 | 13110124 | 35 | 36 | 36 | 42 | 41 | 42 | 41 | 42 | 40 | 41 | 40 | 41 | 40 |
| JAN 27 | 13115153 | 33 | 34 | 34 | 40 | 39 | 40 | 39 | 40 | 38 | 39 | 38 | 39 | 38 |
| JAN 27 | 13121124 | 32 | 33 | 33 | 39 | 38 | 39 | 38 | 39 | 37 | 38 | 37 | 38 | 37 |
| JAN 27 | 13126154 | 30 | 31 | 31 | 36 | 35 | 36 | 35 | 36 | 34 | 35 | 34 | 35 | 34 |
| JAN 27 | 13132125 | 29 | 30 | 30 | 34 | 33 | 34 | 33 | 34 | 32 | 33 | 32 | 33 | 32 |
| JAN 27 | 13137155 | 27 | 28 | 28 | 33 | 32 | 33 | 32 | 33 | 31 | 32 | 31 | 32 | 31 |
| JAN 27 | 13143126 | 26 | 26 | 27 | 33 | 32 | 33 | 32 | 33 | 31 | 32 | 31 | 32 | 31 |
| JAN 27 | 13148155 | 24 | 25 | 25 | 32 | 31 | 32 | 31 | 32 | 30 | 31 | 30 | 31 | 30 |
| JAN 27 | 13154126 | 23 | 24 | 24 | 31 | 30 | 31 | 30 | 31 | 29 | 30 | 29 | 30 | 29 |
| JAN 27 | 13159156 | 21 | 22 | 22 | 29 | 28 | 29 | 28 | 29 | 27 | 28 | 27 | 28 | 27 |
| JAN 27 | 14105127 | 19 | 20 | 20 | 27 | 26 | 27 | 26 | 27 | 25 | 26 | 25 | 26 | 25 |
| JAN 27 | 14110157 | 14 | 19 | 19 | 25 | 24 | 25 | 24 | 25 | 23 | 24 | 23 | 24 | 23 |
| JAN 27 | 14116128 | 17 | 17 | 18 | 24 | 23 | 24 | 23 | 24 | 22 | 23 | 22 | 23 | 22 |
| JAN 27 | 14121158 | 15 | 16 | 16 | 22 | 21 | 22 | 21 | 22 | 20 | 21 | 20 | 21 | 20 |

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PAGE 13

TEMPERATURE-OBSERVATIONS

| RECORD START | HRICH | 11101 | 11102 | 11103 | 11104 | 11105 | 11106 | 11107 | 11108 | 11109 | 11110 | 11111 | 11112 | 11113 | 11114 | 11115 |
|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| JAN 27 14127128 | | 15 | 15 | 16 | 21 | 20 | 18 | 11 | 4 | | | | | | | |
| JAN 27 14132154 | | 14 | 15 | 15 | 20 | 19 | 18 | 11 | 4 | | | | | | | |
| JAN 27 14138129 | | 14 | 16 | 15 | 19 | 18 | 17 | 11 | 4 | | | | | | | |
| JAN 27 14143159 | | 14 | 14 | 14 | 18 | 18 | 16 | 12 | 10 | | | | | | | |
| JAN 27 14149130 | | 14 | 14 | 14 | 18 | 17 | 16 | 12 | 10 | | | | | | | |
| JAN 27 14155100 | | 14 | 14 | 10 | 17 | 17 | 15 | 13 | 10 | | | | | | | |
| JAN 27 15100131 | | 14 | 14 | 14 | 14 | 16 | 15 | 12 | 10 | | | | | | | |
| JAN 27 15106101 | | 14 | 14 | 14 | 14 | 14 | 14 | 11 | 10 | | | | | | | |
| JAN 27 15111132 | | 13 | 14 | 14 | 14 | 15 | 14 | 11 | 10 | | | | | | | |
| JAN 27 15117101 | | 13 | 13 | 13 | 16 | 15 | 14 | 11 | 10 | | | | | | | |
| JAN 27 15122132 | | 13 | 13 | 13 | 15 | 15 | 14 | 11 | 10 | | | | | | | |
| JAN 27 15128102 | | 14 | 13 | 13 | 15 | 15 | 14 | 13 | 12 | | | | | | | |
| JAN 27 15133133 | | 14 | 14 | 14 | 15 | 15 | 14 | 13 | 12 | | | | | | | |
| JAN 27 15139103 | | 14 | 14 | 14 | 15 | 15 | 14 | 13 | 12 | | | | | | | |
| JAN 27 15144134 | | 14 | 12 | 14 | 14 | 14 | 14 | 13 | 11 | | | | | | | |
| JAN 27 15150103 | | 14 | 13 | 14 | 14 | 14 | 14 | 13 | 11 | | | | | | | |
| JAN 27 15155134 | | 14 | 14 | 14 | 14 | 14 | 14 | 13 | 12 | | | | | | | |
| JAN 27 16101104 | | 14 | 14 | 14 | 14 | 14 | 14 | 13 | 12 | | | | | | | |
| JAN 27 16106135 | | 14 | 13 | 13 | 14 | 14 | 14 | 13 | 11 | | | | | | | |
| JAN 27 16112105 | | 14 | 14 | 14 | 14 | 14 | 14 | 13 | 12 | | | | | | | |
| JAN 27 16117136 | | 14 | 14 | 14 | 14 | 14 | 14 | 13 | 12 | | | | | | | |
| JAN 27 16123106 | | 14 | 14 | 14 | 14 | 14 | 14 | 13 | 12 | | | | | | | |
| JAN 27 16128136 | | 14 | 14 | 14 | 14 | 14 | 14 | 13 | 12 | | | | | | | |
| JAN 27 16134106 | | 14 | 14 | 14 | 14 | 14 | 14 | 13 | 12 | | | | | | | |
| JAN 27 16139137 | | 14 | 14 | 14 | 14 | 14 | 14 | 13 | 12 | | | | | | | |
| JAN 27 16145107 | | 14 | 15 | 15 | 14 | 14 | 14 | 13 | 12 | | | | | | | |
| JAN 27 16150138 | | 16 | 16 | 16 | 15 | 15 | 14 | 13 | 12 | | | | | | | |
| JAN 27 16156108 | | 17 | 17 | 17 | 17 | 16 | 15 | 14 | 13 | | | | | | | |
| JAN 27 17101139 | | 18 | 18 | 18 | 16 | 17 | 16 | 15 | 14 | | | | | | | |
| JAN 27 17107108 | | 19 | 20 | 20 | 17 | 18 | 17 | 16 | 15 | | | | | | | |
| JAN 27 17112139 | | 21 | 21 | 21 | 18 | 19 | 18 | 17 | 16 | | | | | | | |
| JAN 27 17118109 | | 22 | 23 | 23 | 19 | 20 | 19 | 18 | 17 | | | | | | | |
| JAN 27 17123140 | | 24 | 24 | 24 | 19 | 20 | 19 | 18 | 17 | | | | | | | |
| JAN 27 17129110 | | 25 | 26 | 25 | 21 | 22 | 21 | 20 | 19 | | | | | | | |
| JAN 27 17134101 | | 27 | 27 | 27 | 22 | 23 | 23 | 22 | 21 | | | | | | | |
| JAN 27 17140114 | | 29 | 29 | 29 | 24 | 25 | 24 | 23 | 22 | | | | | | | |
| JAN 27 17145101 | | 31 | 31 | 31 | 25 | 26 | 25 | 24 | 23 | | | | | | | |
| JAN 27 17151111 | | 32 | 32 | 32 | 26 | 27 | 26 | 25 | 24 | | | | | | | |
| JAN 27 17156142 | | 34 | 34 | 34 | 28 | 29 | 28 | 27 | 26 | | | | | | | |
| JAN 27 18102112 | | 36 | 36 | 35 | 29 | 31 | 30 | 29 | 28 | | | | | | | |
| JAN 27 18107104 | | 37 | 37 | 37 | 31 | 33 | 32 | 31 | 30 | | | | | | | |
| JAN 27 18113112 | | 39 | 39 | 39 | 33 | 34 | 34 | 33 | 32 | | | | | | | |
| JAN 27 18118143 | | 41 | 41 | 41 | 35 | 36 | 35 | 34 | 33 | | | | | | | |
| JAN 27 18124113 | | 43 | 42 | 40 | 35 | 36 | 35 | 34 | 33 | | | | | | | |
| JAN 27 18129104 | | 44 | 44 | 45 | 37 | 38 | 37 | 36 | 35 | | | | | | | |
| JAN 27 18135114 | | 46 | 46 | 47 | 39 | 41 | 40 | 39 | 38 | | | | | | | |

14.48.30

18 7/8

2 hrs 6 min 38 sec

16:56:08

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INTERNAL TEST DATA

TEMPERATURE-DEGREES F

RECORD START RICH - 11101 11102 11103 11104 11105 11106 11107 11108 11109 11110 11111 11112 11113 11114 11115

| | | | | | | | | | | | | | | |
|-----------------|----|----|----|----|----|----|----|----|--|--|--|--|--|--|
| JAN 27 10:40:45 | 48 | 40 | 49 | 40 | 41 | 42 | 51 | 53 | | | | | | |
| JAN 27 10:46:15 | 50 | 50 | 50 | 42 | 44 | 45 | 51 | 55 | | | | | | |
| JAN 27 10:51:45 | 51 | 52 | 52 | 48 | 46 | 45 | 55 | 57 | | | | | | |
| JAN 27 10:57:15 | 53 | 53 | 54 | 45 | 47 | 47 | 56 | 58 | | | | | | |
| JAN 27 10:02:45 | 55 | 55 | 55 | 46 | 49 | 48 | 58 | 60 | | | | | | |
| JAN 27 10:08:15 | 57 | 57 | 57 | 48 | 51 | 50 | 60 | 64 | | | | | | |
| JAN 27 10:13:45 | 50 | 50 | 50 | 50 | 53 | 52 | 62 | 65 | | | | | | |
| JAN 27 10:19:15 | 60 | 60 | 61 | 51 | 55 | 53 | 63 | 65 | | | | | | |
| JAN 27 10:24:45 | 62 | 62 | 62 | 53 | 56 | 55 | 65 | 68 | | | | | | |
| JAN 27 10:30:15 | 64 | 63 | 64 | 55 | 58 | 57 | 67 | 71 | | | | | | |
| JAN 27 10:35:45 | 66 | 65 | 66 | 56 | 60 | 59 | 69 | 72 | | | | | | |
| JAN 27 10:41:15 | 68 | 67 | 68 | 58 | 62 | 61 | 70 | 74 | | | | | | |
| JAN 27 10:46:45 | 69 | 69 | 70 | 61 | 63 | 62 | 71 | 74 | | | | | | |
| JAN 27 10:52:15 | 70 | 70 | 70 | 62 | 65 | 64 | 71 | 75 | | | | | | |
| JAN 27 10:57:45 | 71 | 71 | 71 | 63 | 66 | 65 | 72 | 75 | | | | | | |
| JAN 27 20:03:20 | 71 | 71 | 72 | 64 | 67 | 66 | 71 | 74 | | | | | | |
| JAN 27 20:08:50 | 72 | 72 | 72 | 65 | 68 | 67 | 71 | 74 | | | | | | |
| JAN 27 20:14:20 | 72 | 72 | 73 | 67 | 69 | 69 | 72 | 75 | | | | | | |
| JAN 27 20:19:50 | 73 | 73 | 73 | 67 | 70 | 69 | 72 | 75 | | | | | | |
| JAN 27 20:25:20 | 73 | 73 | 73 | 69 | 70 | 70 | 72 | 75 | | | | | | |
| JAN 27 20:30:50 | 73 | 73 | 73 | 70 | 71 | 71 | 72 | 74 | | | | | | |
| JAN 27 20:36:20 | 73 | 73 | 73 | 70 | 72 | 71 | 72 | 75 | | | | | | |
| JAN 27 20:41:50 | 73 | 73 | 73 | 70 | 72 | 71 | 72 | 75 | | | | | | |
| JAN 27 20:47:20 | 73 | 73 | 73 | 71 | 72 | 72 | 72 | 74 | | | | | | |
| JAN 27 20:52:50 | 74 | 74 | 74 | 71 | 73 | 72 | 72 | 74 | | | | | | |
| JAN 27 20:58:20 | 74 | 74 | 74 | 72 | 73 | 72 | 72 | 74 | | | | | | |
| JAN 27 21:03:50 | 74 | 74 | 74 | 72 | 73 | 73 | 72 | 74 | | | | | | |
| JAN 27 21:09:20 | 74 | 74 | 74 | 73 | 73 | 73 | 72 | 74 | | | | | | |
| JAN 27 21:14:50 | 74 | 74 | 74 | 73 | 73 | 73 | 72 | 74 | | | | | | |
| JAN 27 21:20:20 | 73 | 73 | 73 | 73 | 73 | 72 | 73 | 73 | | | | | | |
| JAN 28 08:27:37 | 76 | 74 | 77 | 73 | 74 | 75 | 85 | 90 | | | | | | |
| JAN 28 08:33:08 | 70 | 77 | 79 | 74 | 75 | 76 | 84 | 84 | | | | | | |
| JAN 28 08:38:38 | 79 | 79 | 80 | 76 | 76 | 77 | 81 | 85 | | | | | | |
| JAN 28 08:44:09 | 80 | 80 | 81 | 76 | 77 | 77 | 81 | 84 | | | | | | |
| JAN 28 08:49:39 | 81 | 81 | 82 | 77 | 78 | 78 | 80 | 85 | | | | | | |
| JAN 28 08:55:09 | 82 | 82 | 82 | 78 | 79 | 79 | 80 | 86 | | | | | | |
| JAN 28 09:00:39 | 83 | 82 | 83 | 78 | 80 | 80 | 81 | 87 | | | | | | |
| JAN 28 09:06:10 | 84 | 83 | 84 | 79 | 81 | 80 | 82 | 87 | | | | | | |
| JAN 28 09:11:40 | 84 | 84 | 84 | 80 | 82 | 81 | 83 | 88 | | | | | | |
| JAN 28 09:17:11 | 85 | 84 | 85 | 81 | 83 | 82 | 84 | 90 | | | | | | |
| JAN 28 09:22:41 | 86 | 85 | 86 | 82 | 84 | 83 | 85 | 91 | | | | | | |
| JAN 28 09:28:11 | 86 | 86 | 87 | 83 | 84 | 84 | 85 | 91 | | | | | | |
| JAN 28 09:33:41 | 86 | 87 | 88 | 84 | 85 | 85 | 88 | 92 | | | | | | |
| JAN 28 09:39:12 | 88 | 88 | 89 | 86 | 86 | 86 | 89 | 93 | | | | | | |
| JAN 28 09:44:42 | 89 | 89 | 90 | 87 | 87 | 87 | 90 | 94 | | | | | | |
| JAN 28 09:50:13 | 90 | 90 | 91 | 88 | 88 | 88 | 90 | 95 | | | | | | |

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TEMPERATURE-DEGREES F

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| | | | | | | | | | |
|--------|----------|-----|-----|-----|-----|-----|-----|-----|-----|
| JAN 28 | 09155143 | 91 | 91 | 92 | 87 | 89 | 88 | 91 | 96 |
| JAN 28 | 10101114 | 92 | 92 | 92 | 88 | 90 | 90 | 92 | 97 |
| JAN 28 | 10106144 | 93 | 92 | 93 | 89 | 91 | 90 | 91 | 98 |
| JAN 28 | 10112115 | 93 | 93 | 94 | 90 | 92 | 91 | 92 | 99 |
| JAN 28 | 10117144 | 94 | 94 | 95 | 91 | 92 | 92 | 94 | 100 |
| JAN 28 | 10123115 | 96 | 95 | 96 | 92 | 93 | 93 | 94 | 100 |
| JAN 28 | 10128145 | 96 | 96 | 97 | 92 | 94 | 94 | 95 | 101 |
| JAN 28 | 10133116 | 97 | 97 | 98 | 93 | 95 | 95 | 96 | 102 |
| JAN 28 | 10139146 | 98 | 98 | 99 | 94 | 96 | 95 | 97 | 103 |
| JAN 28 | 10145117 | 99 | 99 | 99 | 95 | 97 | 96 | 99 | 104 |
| JAN 28 | 10150147 | 100 | 99 | 100 | 96 | 98 | 97 | 99 | 105 |
| JAN 28 | 10156118 | 101 | 100 | 101 | 97 | 99 | 99 | 100 | 106 |
| JAN 28 | 11101147 | 102 | 101 | 102 | 99 | 99 | 99 | 101 | 107 |
| JAN 28 | 11107110 | 103 | 102 | 102 | 99 | 100 | 100 | 101 | 108 |
| JAN 28 | 11112140 | 103 | 103 | 103 | 100 | 101 | 101 | 102 | 108 |
| JAN 28 | 11118119 | 104 | 103 | 104 | 101 | 102 | 102 | 102 | 108 |
| JAN 28 | 11123119 | 104 | 104 | 104 | 101 | 103 | 102 | 103 | 108 |
| JAN 28 | 11129120 | 105 | 104 | 105 | 102 | 103 | 103 | 103 | 109 |
| JAN 28 | 11134150 | 105 | 104 | 105 | 102 | 105 | 104 | 103 | 109 |
| JAN 28 | 11140120 | 106 | 105 | 105 | 103 | 104 | 104 | 103 | 109 |
| JAN 28 | 11145150 | 105 | 105 | 105 | 103 | 104 | 104 | 101 | 107 |
| JAN 28 | 11151121 | 105 | 104 | 104 | 103 | 104 | 104 | 101 | 106 |
| JAN 28 | 11156151 | 105 | 104 | 104 | 103 | 104 | 104 | 101 | 106 |
| JAN 28 | 12102122 | 106 | 104 | 104 | 104 | 105 | 104 | 101 | 106 |
| JAN 28 | 12107152 | 105 | 104 | 104 | 104 | 105 | 105 | 101 | 107 |
| JAN 28 | 12113123 | 105 | 104 | 104 | 104 | 105 | 105 | 101 | 107 |
| JAN 28 | 12118153 | 104 | 104 | 104 | 104 | 105 | 105 | 101 | 106 |
| JAN 28 | 12124124 | 105 | 104 | 104 | 104 | 105 | 105 | 101 | 107 |
| JAN 28 | 12129153 | 105 | 104 | 104 | 104 | 105 | 105 | 101 | 106 |
| JAN 28 | 12135124 | 105 | 104 | 104 | 104 | 105 | 105 | 101 | 106 |
| JAN 28 | 12140154 | 105 | 104 | 104 | 104 | 105 | 105 | 101 | 106 |
| JAN 28 | 12146125 | 105 | 104 | 104 | 104 | 105 | 105 | 101 | 106 |
| JAN 28 | 12151155 | 104 | 104 | 104 | 104 | 105 | 105 | 101 | 106 |
| JAN 28 | 12157126 | 105 | 104 | 104 | 104 | 105 | 105 | 101 | 106 |
| JAN 28 | 13121156 | 105 | 104 | 104 | 104 | 105 | 105 | 101 | 106 |
| JAN 28 | 13108126 | 105 | 104 | 104 | 104 | 105 | 105 | 101 | 107 |
| JAN 28 | 13113156 | 102 | 103 | 102 | 100 | 104 | 104 | 92 | 97 |

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Appendix B

Scan Mirror Assembly Acceptance Test Data

Configuration Verification Index

PART NUMBER 3533002-100
CONTROL ITEM PART NUMBER 3533000-100
SERIAL NUMBER 004
SYSTEM PART NUMBER 3533000-100

6. PROGRAM Theoretical Mapper
7. PREPARED BY P. A. Nicell
8. DATE PREPARED Feb. 9 1981

7. PAGE 1 OF 5
17. COMPLETED BY P. A. Nicell
19. DATE COMPLETED
19. REVISION

Eliahd Model - F33C

| 9. INDEXTURED CONFIGURATION LIST | | | RELEASE & REC-ARDS DATA | | | INSPECTION CONFIGURATION DATA | | | | 16. REMARKS |
|----------------------------------|---------------------------|---------------------|-------------------------|---------------------------|----------------|-------------------------------|---|--|--|-------------|
| 10. DWG REV | 11. EOs, DCHs, RUMs, ETC. | 12. 13. DWG B/S REV | 14. HR NO. | 15. EOs, DCHs, RUMs, ETC. | | | | | | |
| Scan Minor
353130102-100 | W020
64358 | 64374
64365 | | | | | | | | |
| 75312015-004 | 13100
64391 | 64385
64394 | | | | | | | | |
| | 13111 | 13112 | | | | | | | | |
| Frame Assy
3531681874 | 70667
70504 | 64304
70545 | HR.
63974 | 70667
70504 | 70664
70583 | | Interp at 3568900 Level
20711 - Record Chg. only
OK | | | |
| Minor Scan
3531681900 | 70693 | | HR.
47029 | 70693 | | | OK | | | |
| Minor Scan
353168899-2 | SIN 5
W062 | SIN 5
W044 | | | | | Interp at 3568900 Level
14992 W062 + W044 is missing | | | |
| Torquer Assy
353168911 | 64344 | 70672 | HR.
64245 | 64344 | 70672 | | OK | | | |
| Housing Assy
353168909 | A | | HR.
94715 | | | | OK | | | |

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489

(SEE REVERSE SIDE FOR COMPLETION INSTRUCTIONS)

QA-211 (9-74)

PART NUMBER 3533002-100 5. PAGE 2 OF 5
CONTROL ITEM PART NUMBER 3533002-100 6. PROGRAM Therapeutic Mapper
7. PREPARED BY P.A. Nicholl 17. COMPLETED BY P.A. Nicholl
8. DATE PREPARED Feb. 9, 1981 18. DATE COMPLETED _____
SERIAL NUMBER 004 19. REVISION _____
SYSTEM PART NUMBER 3533002-100 Flight Model - E330

na. 11, (274).

| 9. INDENTURED
CONFIGURATION LIST | | RELEASE & RECORDS DATA | | | | INSPECTION CONFIGURATION DATA | | | | | 16. REMARKS | | |
|-------------------------------------|----------|------------------------|---------------------------|---------|----------------|-------------------------------|---------------------------|------|--------|-------|-------------|----------------|---------------|
| | | 10. DWG
REV | 11. EOs, DCHs, RDWs, ETC. | 12. B/H | 13. DWG
REV | 14. HR NO. | 15. EOs, DCHs, RDWs, ETC. | | | | | | |
| can Minor | 13568970 | A | 64322 | 64330 | 64317 | 003 | A | H.R. | 71479 | 64322 | 64330 | 64317
64314 | OK |
| Interface Harness | 13568972 | F | A0070 | | | 005 | E | H.R. | 69739 | 64335 | 64353 | 64323
64318 | Same as Rev F |
| Processor Board | 13568980 | D | 0009 | 0020 | 0024 | 006 | C | H.R. | 69653 | 64350 | 64341 | 64339
64328 | OK |
| Heatsink Assy | 13568995 | N/C | 70482 | 70546 | 70527
70615 | N/A | C | H.R. | F21773 | 70482 | 70546 | 70577 | OK |
| Processor Board | 13568980 | D | 0009 | 0020 | 0024 | 007 | C | H.R. | 69654 | 64350 | 64341 | 64339
64328 | OK |
| Heatsink Assy | 13568995 | N/C | 70482 | 70546 | 70577
70615 | N/A | C | H.R. | F21773 | 70482 | 70546 | 70577 | OK |
| | | E | 0019 | 0023 | 64337
64342 | 006 | E | H.R. | 70163 | 0011 | 0023 | 64337
64342 | OK |
| elec. Comp. Assy | 13568985 | | | | | | | | | | | | |

CONFIGURATION VERIFICATION INDEX

PART NUMBER 253302-100 6. PROGRAM Thematic Mapper 5. PAGE 3 OF 5
 CONTROL ITEM PART NUMBER 353300-100 7. PREPARED BY P.A. Nicholl 17. COMPLETED BY P.A. Nicholl
 SERIAL NUMBER 004 8. DATE PREPARED Feb. 9, 1981 18. DATE COMPLETED
 SYSTEM PART NUMBER 353300-100 Flight Model - E930 19. REVISION

| 9. INDENTURED
CONFIGURATION LIST | RELEASE & RECORDS DATA | | | INSPECTION CONFIGURATION DATA | | | 16. REMARKS | |
|-------------------------------------|------------------------|--------------------------------|----------------|-------------------------------|---------------|---------------------------|----------------|--|
| | 10. DWG
REV | 11. EOs, DCNs, RIMs, ETC. | 12. B/H
REV | 13. DWG
REV | 14. HR NO. | 15. EOs, DCNs, RIMs, ETC. | | |
| Headwind Assy
31568997 | N/C | 70406 70483 | N/A | N/C | F218456 | 70406 70483 | OK | |
| Elec. Comp. Assy
31568985-1 | E | D011
D019 | | | H.R.
70159 | D011
D019 | 64337
64342 | OK |
| Headwind Assy
31568997 | N/C | 70406 70483 | N/A | N/C | F218456 | 70406 70483 | OK | |
| Elec. Comp. Assy
31568990 | D | D029 64355
D017 70684 64319 | | | H.R.
69648 | 70684 | | DATA RNA To New P.C.B.
EO 64355 Ann performed
on 6/24/81 for JAG 1153
EO 64319 Around Chp |
| Scan Angle Monitor
31569087 | N/C | 64311 64359 64347 | N/A | N/C | H.R.
71112 | 64311 64359 64347 | 64308
64347 | EO 64358 against D.P. |
| Scan Mirror
31569000 | D | 6000
70646 70679 | | | H.R.
65235 | 70646 70679 | 64357 | OK |
| Harness Assy
31569018 | B | 70587 64354 64361 | | | H.R.
68135 | 70587 64354 64361 | | EO 64362 only cannot be OK
EO 64354 64361 incomp
at 8569200 level |

CONFIGURATION VERIFICATION INDEX

PART NUMBER 3539002-100 5. PAGE 4 OF 5
CONTROL ITEM PART NUMBER 3539000-100 17. COMPLETED BY P.A. Nicholl
SERIAL NUMBER 004 18. DATE COMPLETED _____
SYSTEM PART NUMBER 3539000-100 19. REVISION _____

6. PROGRAM Theoretical Paper
7. PREPARED BY P.A. Nicholl
8. DATE PREPARED FEB. 9, 1981
Flight Model - F

| 9. INDENTURED
CONFIGURATION LIST | | | RELEASE & RECORDS DATA | | | INSPECTION CONFIGURATION DATA | | | | 16. REMARKS |
|-------------------------------------|--|--|------------------------|-----------------------|--|-------------------------------|---------------|------------------------------|-------|------------------|
| | | | 10. 11.
DWG
REV | EOs, DCNs, RDWs, ETC. | | 12. 13.
S/N
REV | 14.
HR NO. | 15.
EOs, DCNs, RDWs, ETC. | | |
| Indicator Assy | | | D0008 | | | H.R. | D0008 | | OK | |
| 131569010 | | | C | 70622 | | N07 C | 69551 | 70622 | | |
| N.B. | | | | | | | | | | |
| 131569093 | | | N/C | 70336 | | N/A N/C | F208371 | 70336 | OK | |
| Indicator Assy | | | D0008 | | | H.R. | D0008 | | | |
| 131569010 | | | C | 70622 | | D008 C | 69550 | 70622 | OK | |
| W.B. | | | | | | | | | | |
| 131569093 | | | N/C | 70336 | | N/A N/C | F208371 | 70336 | OK | |
| Indicator Assy | | | | | | H.R. | | | | |
| 131569050-1 | | | A | 64332 | | D03 A | 70110 | 64332 | OK | |
| Indicator Assy | | | | | | H.R. | | | | |
| 131569050-2 | | | A | 64332 | | D04 A | 70096 | 64332 | OK | |
| Indicator Assy | | | | | | H.R. | | | | |
| 131569062-1 | | | A | | | N/A N/C | 65184 | 70551 | 70564 | Rev. Not. A req. |
| Indicator Assy | | | | | | H.R. | | | 70553 | |

1. PART NUMBER 3533002-100
2. CONTROL ITEM PART NUMBER 3533000-100
3. SERIAL NUMBER 004
4. SYSTEM PART NUMBER 3533000-100
5. PROGRAM Thematic Mapper
6. PREPARED BY P. A. Nicholl
7. DATE PREPARED Feb 7 1981
8. REVISION _____
9. PAGE 5 OF 5
10. COMPLETED BY P. A. Nicholl
11. DATE COMPLETED _____
12. REVISION _____

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Appendix B

Scan Mirror Assembly Acceptance Test Data

Part 20

Data Tape Log

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DATA SHEET 4.3.0-3
DATA TAPE LOG

IMPORTANT: Before recording data on a
new tape, that tape must
first be marked.

RNA DESIGNATION: FID

S/N: DON'T MIX S/N'S IN DATA TAPES!

PROCEDURE: Insert tape; rewind; type in:
trk0;art1,20;(execute);rewind
trk1;art1,20;(execute);-ready

Each data set will have a normal & reserve data tape

| DATA TAPE NAME: | | | | | | | | | | PLOT | TESTED
BY | DATE | PREP
TOPP | MIRROR
POSITION | QID
NO. | TYPE
TEST | MODE
B-D | DATA
TYPE | FILE NO. S | FILE NO. SC | N | COMMENTS |
|-----------------|----|----|----|----|---|---|---|------|---|------|--------------|--------|--------------|--------------------|------------|--------------|-------------|--------------|------------|-------------|----|-----------|
| TRN
NO. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | | | | | | | | | | | | | |
| 0 | 1 | 2 | 3 | 4 | P | 1 | S | H-2 | 1 | NORM | 0.45 | 1/9/81 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 73 | NO X-Data |
| 0 | 5 | 6 | 7 | 8 | P | 1 | B | H-3 | 1 | NORM | 6.30 | 1/9/81 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 72 | 0.5000? |
| 0 | 9 | 10 | 11 | 12 | P | 2 | S | H-4 | 1 | NORM | 7.20 | 1/9/81 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 71 | 0.5000? |
| 0 | 13 | 14 | 15 | 16 | P | 2 | B | H-5 | 1 | NORM | 9.40 | 1/9/81 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 70 | 0.5000? |
| 0 | 17 | 18 | | | S | 1 | S | K-1 | 1 | NORM | .5 | 1/9/81 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 69 | 0.5000? |
| 0 | 19 | 20 | | | S | 1 | B | K-3 | 1 | NORM | .65 | 1/9/81 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 68 | 0.5000? |
| 0 | 21 | 22 | | | S | 2 | S | K-8 | 1 | NORM | .7 | 1/9/81 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 67 | 0.5000? |
| 0 | 23 | 24 | | | S | 2 | B | K-9 | 1 | NORM | .9 | 1/9/81 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 66 | 0.5000? |
| 0 | 25 | 26 | | | S | 1 | S | S-1 | 1 | NORM | .4 | 1/9/81 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 65 | 0.5000? |
| 0 | 27 | 28 | | | S | 1 | B | S-3 | 1 | NORM | .47 | 1/9/81 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 64 | 0.5000? |
| 1 | 1 | 2 | 3 | | G | 1 | S | K-5 | 1 | NORM | 11.5 | 1/9/81 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 63 | 0.5000? |
| 1 | 4 | 5 | 6 | | G | 2 | S | K-12 | 1 | NORM | 12.5 | 1/9/81 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 62 | 0.5000? |
| 1 | 7 | 8 | | | S | 2 | S | S-4 | 1 | NORM | .5 | 1/9/81 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 61 | 0.5000? |
| 1 | 9 | 10 | | | S | 2 | B | S-10 | 1 | NORM | .52 | 1/9/81 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 60 | 0.5000? |
| 1 | 11 | 12 | 13 | | G | 1 | S | S-5 | 1 | NORM | 11.2 | 1/9/81 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 59 | 0.5000? |
| 1 | 14 | 15 | 16 | | G | 2 | B | S-11 | 1 | NORM | 11.2 | 1/9/81 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 58 | 0.5000? |

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DATA SHEET 4.3.0-3
DATA TAPE LOG

SMA DESIGNATION: FID2
S/N: 4 DON'T MIX S/N'S IN DATA TAPES!

IMPORTANT: Before recording data on a new tape, that tape must first be carked.

PROCEDURE: Insert tape; rewind; type in: trk0;ark1,20;(execute);rewind trk1;ark1,20;(execute);-ready

Each data set will have a normal & reserve data tape

DATA TAPE NAME:

| TRK NO. | FILE NO. 1 | DATA TYPE 1-2 | MODE 3-8 | TEST | CEB NO. | HIER POSITION | PRECOR CORR | DATE | TESTED BY | DATE | PLT | SC | COMMENTS |
|---------|------------|---------------|----------|------|---------|---------------|-------------|---------|-----------|------|-----|----|--|
| 0 | 1 2 3 | G | 2 | S | 1 | NORM | AD 11 | 1/14/61 | ✓ | ✓ | ✓ | ✓ | 67 |
| 0 | 4 5 | S | 1 | S | 1 | N | 3 | 1/18/61 | ✓ | ✓ | ✓ | ✓ | |
| 0 | 6 7 | S | 1 | B | 1 | N | | 1/18/61 | ✓ | ✓ | ✓ | ✓ | |
| 0 | 8 9 | S | 2 | S | 1 | N | | 1/18/61 | ✓ | ✓ | ✓ | ✓ | |
| 0 | 10 11 | S | 2 | B | 1 | N | | 1/18/61 | ✓ | ✓ | ✓ | ✓ | |
| 0 | 12 13 14 | G | 1 | S | 1 | N | 1.4 | 1/18/61 | ✓ | ✓ | ✓ | ✓ | 72 |
| 1 | 1 2 3 | G | 2 | S | 1 | N | 1.6 | 1/18/61 | ✓ | ✓ | ✓ | ✓ | 69 |
| 1 | 4 5 6 | G | 2 | S | 1 | N | 2.1 | 1/18/61 | ✓ | ✓ | ✓ | ✓ | 72 R-10 of K-12 |
| 1 | 7 8 9 | G | 2 | S | 1 | N | 2.5 | 1/18/61 | ✓ | ✓ | ✓ | ✓ | 72 R-10 of K-12 |
| 1 | 10 11 12 | G | 2 | B | 3 | N | | 2/3/61 | ✓ | ✓ | ✓ | ✓ | 72 R-10 of K-12
51022
SMA 2 Bump
74 SPEC 101 TEST |

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DATA SHEET 4.3.0-3
DATA TAPE LOG

IMPORTANT: Before recording data on a
new tape, that tape must
first be marked.

SMA DESIGNATION: F1D3
Q/H: 4 DON'T MIX S/M'S IN DATA TAPES!

PROCEDURE: Insert tape; rewind; type in:
trk0;ark1,20;(execute);rewind
trk1;ark1,20;(execute);-ready

Each data set will have a normal & reserve data tape

| TRK
NO. | FILE NO. | | DATA
1-PE | SME
1-2 | MODE
S-B | TYPE
TEST | QES
NO. | MINOR
POSITION | PRESS
terr | DATE | TESTED
BY | PLOT | | | | N | COMMENT |
|------------|----------|----|--------------|------------|-------------|--------------|------------|-------------------|---------------|------|--------------|------|------|------|------|----|---------------|
| | 1 | 2 | | | | | | | | | | ark0 | ark1 | ark2 | ark3 | | |
| 0 | 1 | 2 | 3 | 4 | P | 1 | S | H2 | 1 | NORM | .65 | | | | | 74 | 3 bolt out |
| 0 | 5 | 6 | 7 | 8 | P | 1 | B | H3 | 1 | N | .7 | | | | | 75 | " |
| 0 | 9 | 10 | 11 | 12 | P | 2 | S | H14 | 1 | N | .72 | | | | | 76 | " |
| 0 | 13 | 14 | 15 | 16 | P | 2 | B | H15 | 1 | N | .75 | | | | | 77 | " |
| 0 | 17 | 18 | 19 | 20 | P | 1 | S | H2 | 2 | N | | | | | | 78 | 3 bolts gone |
| 0 | 21 | 22 | 23 | 24 | P | 1 | B | H3 | 2 | N | | | | | | 79 | " |
| 0 | 25 | 26 | 27 | 28 | P | 2 | S | H14 | 2 | N | .6 | | | | | 80 | " |
| 0 | 29 | 30 | 31 | 32 | P | 2 | B | H15 | 2 | N | .65 | | | | | 81 | " |
| 0 | 33 | 34 | 35 | 36 | P | 1 | S | H2 | 3 | N | .55 | | | | | 82 | All bolts 10) |
| 0 | 37 | 38 | 39 | 40 | P | 1 | B | H3 | 3 | N | .6 | | | | | 83 | USE |
| 0 | 41 | 42 | 43 | 44 | P | 2 | S | H14 | 3 | N | .61 | | | | | 84 | for |
| 0 | 45 | 46 | 47 | 48 | P | 2 | B | H15 | 3 | N | .7 | | | | | 85 | ACCEPT |
| 1 | 1 | 2 | | | S | 1 | S | H2 | 3 | N | .98 | | | | | 86 | TEST |
| 1 | 3 | 4 | | | S | 1 | B | H3 | 3 | N | | | | | | 87 | |
| 1 | 5 | 6 | | | S | 2 | S | H14 | 3 | N | 1.05 | | | | | 88 | |
| 1 | 7 | 8 | | | S | 2 | B | H15 | 3 | N | 1.2 | | | | | 89 | |
| 1 | 9 | 10 | 11 | | G | 1 | S | H2 | 3 | N | 1.1 | | | | | 90 | |
| 1 | 12 | 13 | 14 | | G | 2 | S | H14 | 3 | N | 1.2 | | | | | 91 | |

DATA TAPE NAME:

Each data set will have a normal & reserve data tape

| TRN NO. | FILE NO. 0 | | | DATA TYPE | SME TYPE | MODE 1-2 | MODE 3-8 | TYPE TEST | QED NO. | NUMBER POSITION | PRICE | DATE | TESTED BY | PLOT DATE | PLOT M1123 sec | M COMMENTS |
|------------------|------------|----|----|-----------|----------|----------|----------------|--------------|---------|-----------------|--------------|--------------|--------------|--------------|----------------|------------|
| | 1 | 0 | 0 | | | | | | | | | | | | | |
| 0 | 1 | 2 | | S | 1 | S | K-1 | 3 | | 2 | 1.1 | 1/5/51 | B | 1/10/51 | ✓ | |
| 0 | 3 | 4 | | S | 1 | B | K-3 | 3 | | 1 | 1.2 | " | " | ✓ | | |
| 0 | 5 | 6 | | S | 2 | S | K-8 | 3 | | " | 1.3 | " | " | ✓ | | |
| 0 | 7 | 8 | | S | 2 | B | K-10 | 3 | | " | 1.4 | " | " | ✓ | | |
| 0 | 9 | 10 | 11 | G | 1 | S | K-5 | 3 | | 1 | 1.5 | " | " | ✓ | ✓ | |
| 0 | 12 | 13 | 14 | G | 2 | S | K-12 | 3 | | " | 1.7 | " | " | ✓ | ✓ | |
| 0 | 15 | 16 | | S | 1 | S | K-1 | 3 | | " | .6 | " | " | ✓ | ✓ | |
| 1 | 1 | 1 | 2 | S | 1 | B | S-3 | 3 | | " | .8 | " | " | ✓ | ✓ | |
| 1 | 3 | 4 | | S | 2 | S | S-8 | 3 | | " | .9 | " | " | ✓ | ✓ | |
| 1 | 5 | 6 | | S | 2 | B | S-10 | 3 | | 1 | 1.0 | " | " | ✓ | ✓ | |
| 1 | 7 | 8 | 9 | G | 1 | S | S-5 | 3 | | " | 1.1 | " | " | ✓ | ✓ | |
| 1 | 10 | 11 | 12 | G | 2 | S | S-12 | 3 | | " | 1.15 | " | " | ✓ | ✓ | |
| 1 | 13 | 14 | | S | 1 | S | L-9 | 3 | | " | 1.0 | " | " | ✓ | ✓ | |
| 1 | 15 | 16 | | S | 1 | B | L-11 | 3 | | " | 1.1 | " | " | ✓ | ✓ | |
| 1 | 17 | 18 | | S | 2 | S | S-7 | 3 | | " | " | " | " | ✓ | ✓ | |
| All DATA NO GOOD | | | | | | | | | | | | | | | | |
| WRONG SHIMS | | | | | | | | | | | | | | | | |

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DATA SHEET 4.3.0-3
F-100 T-100

SEA DESIGNATION:

S/N: 4 DON'T MIX S/N'S IN DATA TAPES!

IMPORTANT: Before recording data on a
new tape, that tape must
first be marked.

PROCEDURE: Insert tape; rewind; type in:
trd0;ark1,20;(execute);rewind
trd1;ark1,20;(execute);-ready

Each data set will have a normal & reserve data tape

| TRK
NO. | FILE NO. 0 | | | DATA
TYPE | DATE
1-2 | MODE
0-9 | TEST
TEST | CIR
NO. | MIR
POSITION | PRESS
TEMP | DATE | TESTED
BY | PLOT | | | N | COMMENTS |
|------------|------------|----|----|--------------|-------------|-------------|--------------|------------|-----------------|---------------|--------|--------------|------|---|---|-----|------------------------------|
| | 1 | 2 | 3 | | | | | | | | | | Auto | 1 | 2 | 3 | |
| 0 | 1 | 2 | | S | 12 | 05 | L-10 | 3 | Nor | 1.1 | 12/21 | RS | ✓ | ✓ | ✓ | | K.S.L. No Good |
| 0 | 3 | 4 | | S | 2 | 5 | L-18 | 3 | " | 1.2 | 1-19/4 | RS | ✓ | ✓ | ✓ | | re-do seg 4.
wrong shines |
| 0 | 5 | 6 | 7 | G | 1 | 5 | L-13 | 3 | " | 0.85 | 1-4/8 | RS | ✓ | ✓ | ✓ | 081 | (+5) |
| 0 | 8 | 9 | 10 | G | 2 | 5 | L-20 | 3 | " | 0.90 | 1-4/4 | RS | ✓ | ✓ | ✓ | 071 | (+1) |
| 0 | 11 | 12 | | S | 1 | 5 | N-9 | 3 | " | 0.87 | 1-2/1 | RS | ✓ | ✓ | ✓ | | w/ proper
shins |
| 0 | 13 | 14 | | S | 1 | 5 | N-11 | 3 | " | 0.9 | " | RS | ✓ | ✓ | ✓ | | |
| 0 | 15 | 16 | | S | 2 | 5 | N-16 | 3 | " | 0.95 | " | RS | ✓ | ✓ | ✓ | | |
| 1 | 1 | 2 | | S | 2 | 5 | N-18 | 3 | " | 1.0 | " | RS | ✓ | ✓ | ✓ | | |
| 1 | 3 | 4 | 5 | G | 1 | 5 | N-12 | 3 | " | 1.1 | " | RS | ✓ | ✓ | ✓ | 77 | |
| 1 | 6 | 7 | 8 | G | 2 | 5 | N-20 | 3 | " | 1.0 | " | RS | ✓ | ✓ | ✓ | 71 | ← 2nd run plus |
| 1 | 9 | 10 | 11 | P | 1 | 5 | H-3 | 4 | " | 0.5 | | | ✓ | ✓ | ✓ | 73 | |
| 1 | 13 | 14 | 15 | P | 1 | 5 | H-3 | 4 | " | 0.6 | | | ✓ | ✓ | ✓ | 73 | |
| 1 | 17 | 18 | 19 | P | 2 | 5 | H-14 | 4 | " | 0.7 | | | ✓ | ✓ | ✓ | 73 | |
| 1 | 21 | 22 | 23 | P | 2 | 5 | H-15 | 4 | " | 0.75 | | | ✓ | ✓ | ✓ | 73 | |
| 1 | 25 | 26 | 27 | P | 1 | 5 | H-2 | 5 | " | 0.45 | 1-5/4 | RS | ✓ | ✓ | ✓ | 73 | |

Test 1 NO GOOD
wrong shines

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DATA SHEET 4.3.0-3
DATA TYPE LOG

IMPORTANT: Before recording data on a new tape, that tape must first be sorted.

SSA DESIGNATION: E-1
S/N: 4 DON'T MIX S/N'S IN DATA TAPES!

```

PROCEDURE: Insert tape; rewind; type in:
          trk0;ark1,20;(execute);rewind
          trk1;ark1,20;(execute);-ready

```

Each data set will have a normal & reserve data tape

| DATA TAPE NAME: | | | | | | | | | | | | | | | | | |
|-----------------|----------|--------|-----------|---------|----------|-----------|---------|-----------------|------------|--------|-----------|------|---|---|---|--------------------|----------|
| TRN NO. | FILE NO. | | DATA TYPE | SWE 1-2 | MODE S-D | TFEB TEST | SEQ NO. | HIGHER POSITION | PRESS LEFT | DATE | TESTED BY | PLOT | | | | M | COMMENTS |
| | 1 | 2 | | | | | | | | | | 1 | 2 | 3 | 4 | | |
| 0 | 1 | 234 | P | 1 | S | H-2 | 6 | Norm | .7 | 3/2/61 | B | | | | | 104 NEW SOFTWARE | |
| 0 | 5 | 678 | P | 1 | B | H-3 | 6 | " | .8 | " | " | | | | | 105 CORRECT angles | |
| 0 | 9 | 101112 | P | 2 | S | H-14 | 6 | " | .95 | " | " | | | | | 107 | |
| 0 | 13 | 141516 | P | 2 | B | H-15 | 6 | " | 1.2 | " | " | | | | | 108 | |
| 0 | 17 | 1819 | G | 1 | S | I-1 | 6 | " | .85 | 3/2/61 | B | | | | | 109 | |
| 0 | 20 | 21 | S | 1 | S | K-1 | 6 | " | 1.1 | 3/2/61 | B | | | | | 110 | |
| 0 | 22 | 23 | S | 1 | B | K-3 | 6 | " | 1.1 | " | " | | | | | 111 | |
| 0 | 24 | 25 | S | 2 | S | K-8 | 6 | " | 1.2 | " | " | | | | | 112 | |
| 0 | 26 | 27 | S | 2 | B | K-10 | 6 | " | 1.2 | " | " | | | | | 113 | |
| 1 | 1 | 23 | G | 1 | S | K-5 | 6 | " | 1.4 | " | " | | | | | 114 | |
| 1 | 4 | 56 | G | 2 | S | K-12 | 6 | " | 1.5 | " | " | | | | | 115 | |
| 1 | 7 | 8 | S | 1 | S | S-1 | 6 | " | .4 | 3/2/61 | B | | | | | 116 | |
| 1 | 9 | 10 | S | 1 | B | S-3 | 6 | " | .5 | " | " | | | | | 117 | |
| 1 | 11 | 12 | S | 2 | S | S-8 | 6 | " | .6 | " | " | | | | | 118 | |
| 1 | 13 | 14 | S | 2 | B | S-10 | 6 | " | 1.0 | " | " | | | | | 119 | |
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IMPORTANT: Before recording data on a new tape, that tape must first be worked.

DATA TAPE LOG

```
PROCEDURE: Insert type; revind; type in:
          trk0;ark1,20;(execute);revind
          trk1;ark1,20;(execute);-ready
```

Each data set will have a normal & reserve data tape

| DATA TAPE NAME: | | | | | | | | | | | | | | | | | | |
|-----------------|------------|----|---|-----------|----------|----------|-----------|---------|-----------------|------------|--------|-----------|------|---|---|---|----------|---|
| TRM NO. | FILE NO.'s | | | DATA TYPE | SIZE 1-2 | CODE 3-8 | TYPE TEST | SER NO. | MIRROR POSITION | PRESS CORR | DATE | TESTED BY | PLOT | | | K | COMMENTS | |
| | 1 | 2 | 3 | | | | | | | | | | DATE | 1 | 2 | | | 3 |
| 0 | 1 | 2 | 3 | G | 1 | S | S-5 | 6 | Norm | .85 | 3/4/61 | B | | ✓ | ✓ | ✓ | 85 | |
| 0 | 4 | 5 | 6 | G | 2 | S | S-12 | 6 | " | .95 | " | " | | ✓ | ✓ | ✓ | 78 | |
| 0 | 7 | 8 | | S | 1 | S | L-9 | 6 | Norm | 1.25 | 3/5/61 | B | | ✓ | ✓ | | | |
| 0 | 9 | 10 | | S | 1 | B | L-11 | 6 | " | 1.4 | " | " | | ✓ | ✓ | | | |
| 0 | " | 12 | | S | 2 | S | L-16 | 6 | " | 1.5 | " | " | | ✓ | ✓ | | | |
| 0 | 13 | 14 | | S | 2 | B | L-18 | 6 | " | 1.55 | " | " | | ✓ | ✓ | | | |
| 1 | 1 | 2 | 3 | G | 1 | S | L-13 | 6 | " | 1.6 | " | " | | ✓ | ✓ | ✓ | 90 | |
| 1 | 4 | 5 | 6 | G | 2 | S | L-20 | 6 | " | 1.7 | " | " | | ✓ | ✓ | ✓ | 82 | |
| 1 | 7 | 8 | | S | 1 | S | N-9 | 6 | " | .7 | 3/6/61 | B | | ✓ | ✓ | | | |
| 1 | 9 | 10 | | S | 1 | B | N-11 | 6 | " | .75 | " | " | | ✓ | ✓ | | | |
| 1 | 11 | 12 | | S | 2 | S | N-16 | 6 | " | .8 | " | " | | ✓ | ✓ | | | |
| 1 | 13 | 14 | | S | 2 | B | N-18 | 6 | " | .9 | " | " | | ✓ | ✓ | | | |

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DATA SHEET 4.3.0-3
DATA TAPE LOG

SMA DESIGNATION: F-1

S/N: 4 DON'T MIX S/N'S IN DATA TAPES!

IMPORTANT: Before recording data on a new tape, that tape must first be marked.

PROCEDURE: Insert tape; rewind; type in: trk0;ark1,20;(execute);rewind trk1;ark1,20;(execute);-ready

Each data set will have a normal & reserve data tape

DATA TAPE NAMES

| TRK NO. | FILE NO. 1 | FILE NO. 2 | DATA TYPE 1-2 | MODE 1-2 | TEST 1-2 | REF NO. | HISTORY POSITION | PRESS | DATE | TESTED BY | PLOT | # | COMMENTS |
|---------|------------|------------|---------------|----------|----------|---------|------------------|-------|---------|-----------|------|----|----------|
| 0 | 1 | 2 | 3 | G | 1 | N-13 | 6 | 1.0 | 3/6/64 | B | ✓ | 89 | |
| 0 | 4 | 5 | 6 | G | 2 | N-10 | 6 | 1.1 | " | " | ✓ | 75 | |
| 0 | 7 | 8 | | S | 1 | R-9 | 6 | 1.2 | 3/10/64 | B | ✓ | | |
| 0 | 9 | 10 | | S | 1 | R-11 | 6 | 1.3 | " | " | ✓ | | |
| 0 | 11 | 12 | | S | 2 | R-14 | 6 | 1.4 | " | " | ✓ | | |
| 0 | 13 | 14 | | S | 2 | R-18 | 6 | 1.5 | " | " | ✓ | | |
| 1 | 1 | 2 | 3 | G | 1 | R-13 | 6 | 1.4 | 3/10/64 | " | ✓ | 91 | |
| 1 | 4 | 5 | 6 | G | 2 | R-20 | 6 | 1.5 | " | " | ✓ | 79 | |
| 1 | 7 | 8 | 9 | P | 1 | R-2 | 7 | 1.6 | 3/10/64 | " | ✓ | 90 | END DATA |
| 1 | 11 | 12 | 13 | P | 1 | R-3 | 7 | 1.6 | " | " | ✓ | 91 | |
| 1 | 15 | 16 | 17 | P | 2 | R-14 | 7 | 1.7 | " | " | ✓ | 92 | |
| 1 | 19 | 20 | 21 | P | 2 | R-15 | 7 | 1.8 | " | " | ✓ | 93 | |

1-INIT/LAT data file: 1-SCN data file: 1-ORSH/AVG GRAN data file: 1-ORSH/AVG

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Appendix R

Scan Mirror Assembly Acceptance Test Data
Requests For Deviations And Waivers

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REQUEST FOR DEVIATION/WAIVER
(SEE MIL-STD-460 OR 461 FOR INSTRUCTIONS)

DATE PREPARED
2/29/80

PRECEDING ACTIVITY NO.

| | | | | | | | |
|---|--------------|----------------------|------------------------|---|--------------------------------------|------------------------------------|--|
| 1. ORIGINATOR NAME AND ADDRESS
Hughes Aircraft Co. (SSD) El Segundo, CA | | | | 2. <input type="checkbox"/> DEVIATION <input checked="" type="checkbox"/> WAIVER
3. <input checked="" type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> CRITICAL | | | |
| 4. DESIGNATION FOR DEVIATION/WAIVER | | | | 5. BASE LINE AFFECTED | | | |
| 6. MODEL/TYPE | 7. MFR. CODE | 8. SYS. DESIG.
TM | 9. REVISED NO.
W020 | <input type="checkbox"/> FUNC. TIONAL | <input type="checkbox"/> ALLD. CATED | <input type="checkbox"/> PROD. UCT | 10. OTHER SYSTEMS/CONF. DATION ITEMS AFFECTED
<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO |
| 7. SPECIFICATIONS AFFECTED-TEST PLAN | | | | 8. DRAWINGS AFFECTED | | | |
| MFR. CODE | | SPEC./DOC. NO. | | MFR. CODE | | NUMBER | |
| | | | | 82577 | | 3533002-100 | |
| 9. TEST PLAN | | | | | | C | |
| 9. TITLE OF DEVIATION/WAIVER
Acceptability of Standard Mounting Hardware | | | | 10. CONTRACT NO. & LINE ITEM
NASS-24200 | | | |
| 11. SUBMITTER'S SIGNATURE
Scan Mirror Assembly 3533002-100 | | | | 12. DEFECT NO. | | | |
| 13. NAME OF PART OR LATEST ASSEMBLY AFFECTED
SMA | | | | 14. DEFECT CLASSIFICATION
<input type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> CRITICAL | | | |
| 15. PART NO. OR TYPE DESIGN
3533002-100 | | | | 16. REQUIRING DEVIATION/WAIVER
<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | | | |
| 17. EFFECT ON COST/PRICE
None | | | | 18. EFFECT ON DELIVERY SCHEDULE
3 month slip in all flight hardware | | | |
| 19. EFFECT ON INTEGRATED LOGISTIC SUPPORT, INTERFACE, ETC. | | | | | | | |

23. DESCRIPTION OF DEVIATION/WAIVER

Standard mounting hardware (i.e. nuts, bolts, screws, washers) as stated in POR #E330 (Culver City) requires Quality Status prior to acceptance into bonded stores. These parts were inspected per contractual requirements upon receipt, however, due to the Hughes System of Corporate Buys, the quality status tag normally provided for contract identification was not provided to bonded stores.

FILE COPY

24. REASON FOR DEVIATION/WAIVER

These parts are incorporated into flight hardware and to disassemble, remove hardware and replace would cause an extreme slip in SMA deliveries. ALL REMAINING HARDWARE IN TM STREET WPS OWN REMOVED AND REINSPECTED FOR FLIGHT USE AND ACCEPTED. SOME ITEMS WERE FOUND TO BE OUT OF DIMENSION HOWEVER THESE CHARACTERISTIC WOULD NOT EFFECT FORM FIT OR FUNCTION.

P. J. [Signature]

2/29/80
CNO H. Rodriguez

25. AUTHORITY EFFECTIVITY OF INITIAL ACTION

| | | | |
|---|--|---|--|
| 26. AUTHORITY EFFECTIVITY OF INITIAL ACTION
H. [Signature] 4 MAR 80 | | 27. APPROVAL/DISAPPROVAL
MFR. SYSTEM ERROR | |
| 28. APPROVAL/DISAPPROVAL
<input type="checkbox"/> APPROVAL <input checked="" type="checkbox"/> DISAPPROVED | | 29. SIGNATURE
[Signature] | |
| 30. DATE
7/25/80 | | 31. DATE
7/25/80 | |

DD FORM 1694

a. [Signature]

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To preclude this problem from recurring and to insure the quality status of the hardware in the present flight units, the remaining stock in bonded stores will be reinspected to the appropriate specification, properly identified with a status tag, and returned to bonded stores.

The need to replenish any of this stock in bonded stores will be cause for reinspection of the material and attachment of the proper status tag prior to inclusion into stores.

[Signature]
2/29/80

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REQUEST FOR DEVIATION/WAIVER
(SEE MIL-STD-460 OR 461 FOR INSTRUCTIONS)

DATE PREPARED
21 October 1980

PROCURING ACTIVITY NO.

| | | | | | |
|--|-----------------------|--------------------------|--------------------------|---|-------------------------------------|
| 1. ORIGINATOR NAME AND ADDRESS
Hughes Aircraft Co.
Culver City, CA | | | | 2. <input type="checkbox"/> DEVIATION <input checked="" type="checkbox"/> WAIVER | |
| | | | | 3. <input checked="" type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> CRITICAL | |
| 4. DESIGNATION FOR DEVIATION/WAIVER | | | | 5. BASE LINE AFFECTED | |
| a. MODEL/TYPE
TM | b. MFR. CODE
82577 | c. SYS. DESIG.
HS-236 | d. EST/DAIVER NO
W062 | <input type="checkbox"/> FUNC. TIONAL | <input type="checkbox"/> ALLO-CATED |
| | | | | <input checked="" type="checkbox"/> PROD. UCT | |
| 7. SPECIFICATIONS AFFECTED-TEST PLAN | | | | 8. OTHER SYSTEMS/CONFIGURATION ITEMS AFFECTED | |
| a. SYSID. | b. MFR. CODE | c. SPEC./DOC. NO. | d. ESN | e. YES | f. NO |
| | | | | | |
| 9. TITLE OF DEVIATION/WAIVER
Acceptability of Mirror Not-Conforming to Dwg Flatness & Scatter | | | | 10. CONTRACT NO. & LINE ITEM
NAS 5-24200 | |
| 11. CONFIGURATION ITEM NOMENCLATURE
SCAN MIRROR ASSEMBLY 3533002-100 | | | | 12. CD NO. | |
| 13. NAME OF PART OR LOCUST ASSEMBLY AFFECTED
Mirror, Scan S/N 005 | | | | 14. DEFECT CLASSIFICATION
<input checked="" type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> CRITICAL | |
| 15. PART CD. OR TYPE DESIG.
3568899 | | | | 16. DEFECT NO. | |
| 17. LOT NO.
N/A | | | | 18. QTY
1 | |
| 19. EFFECT ON COST/PRICE
None | | | | 20. OCCURRING DEVIATION/WAIVER
<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | |
| 21. EFFECT ON DELIVERY SCHEDULE
2 months minimum slip on FI SMA delivery | | | | 22. EFFECT ON INTEGRATED LOGISTIC SUPPORT, INTERFACE, ETC. | |

23. DESCRIPTION OF DEVIATION/WAIVER

Item 1 Scatter: DWG 3568899

Note 19 calls out total integrated hemispherical scatter $\leq 0.2\%$. The scatter requirement for S/N 005 is 0.35% and out of dwg tolerance. The 0.2% dwg specification is considerably tighter than the Scan Mirror Assembly specification of 1.0% , in order to assure meeting the Assembly specification. A mirror with 0.35% scatter upon assembly will still meet the 1.0% Assembly Level specification.

Item 2 Flatness: DWG 3568899

Note 6 calls out surface flatness of 0.25 wave at $.6328$ micrometers. Mirror measures (continued)

24. REASON FOR DEVIATION/WAIVER

This mirror has already been reworked and repolished to correct a surface figure degradation caused by thermal cycling. Additional polishing runs a very high risk of breaking through the nickel plating, which would then require the stripping the (continued)

REA AB Marchant SE Richard Klein
Prepared by AB Marchant, M.P. Wirick

25. PRODUCTION AUTHORITY BY ISATE NUMBER

S/N 005 ONLY

26. AUTHORITY ACTIVITY
William H. H. Freudenstein

27. APPROVAL/DISAPPROVAL
System Engineering

| | | | |
|---|--|---|--|
| 28. APPROVAL/RECOMMENDATION
<input checked="" type="checkbox"/> APPROVAL RECOMMENDED | | 29. APPROVED
<input checked="" type="checkbox"/> APPROVED <input type="checkbox"/> DISAPPROVED | |
| 30. AUTHORITY ACTIVITY
LANDSAT-D P.O. | | 31. SIGNATURE
V. Weirick | |
| 32. DATE
10/23/80 | | 33. DATE
10/23/80 | |

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70-41-10 80-10-27

RDW # W062
Page 2
21 October 1980

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23. Description of Deviation/Waiver continued..

at 0.29 wave at .6328 micrometers. This 0.05 wave degradation from the call out specification will not prevent the mirror from meeting the Assembly specification of $\leq 5\%$ MTF degradation. (Expected MTF degradation $\sim 1\%$ from Static Flatness).

24. Need for Deviation/Waiver continued..

nickel, replating, and repolishing. The schedule slip to accomplish this rework would be a minimum of two months. Since this mirror is a pacing item on FI SMA, delivery extension on a day for day slip basis of two months will have a considerable cost impact. Further, replating increases the risk of losing the mirror completely due to braze failure.

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Page 1 of 2

REQUEST FOR DEVIATION/WAIVER
(SEE MIL-STD-460 OR 461 FOR INSTRUCTIONS)

DATE PREPARED
11 June 1980

PRECEDING ACTIVITY NO.

| | | | | | | | |
|--|-----------------------|-------------------------|----------------------------|---|--------------------------------------|---|--|
| 1. ORIGINATOR NAME AND ADDRESS
Hughes Aircraft Company
Culver City, CA | | | | 2. <input type="checkbox"/> DEVIATION <input checked="" type="checkbox"/> WAIVER | | | |
| | | | | 3. <input checked="" type="checkbox"/> MINOR <input checked="" type="checkbox"/> MAJOR <input type="checkbox"/> CRITICAL | | | |
| 4. DESIGNATION FOR DEVIATION/WAIVER | | | | 5. BASE LINE AFFECTED | | | |
| 6. MODEL/TYPE
TM | 7. MFR. CODE
82577 | 8. SYS. DESIG.
HS236 | 9. DEV/WAIVER NO.
W-044 | <input type="checkbox"/> FUNC. TIONAL | <input type="checkbox"/> ALLO. CATED | <input checked="" type="checkbox"/> PROD. UCT | 10. OTHER SYSTEMS/CONFIG. RATION ITEMS AFFECTED
<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO |
| 7. SPECIFICATIONS AFFECTED-TEST PLAN | | | | 8. DRAWINGS AFFECTED | | | |
| 11. MFR. CODE | 12. SPEC./DOC. NO. | 13. S/N | 14. MFR. CODE | 15. NUMBER | 16. REV. | 17. MOD. NO. | |
| 82577 | | | 82577 | 3568899 | B | N/A | |
| 9. TITLE OF DEVIATION/WAIVER
Acceptability of Cracked Mirror | | | | 10. CONTRACT NO. & LINE ITEM
NA55-24200 | | | |
| 11. CONFIGURATION TYPE & RELATIONSHIP
Scan Mirror Assembly 3533002-100 | | | | 12. CB NO. | | | |
| 13. NAME OF PART OR LATEST ASSEMBLY AFFECTED
Mirror, Scan S/N 005 | | | | 14. DEFECT CLASSIFICATION
<input type="checkbox"/> MINOR <input checked="" type="checkbox"/> MAJOR <input type="checkbox"/> CRITICAL | | | |
| 15. PART NO. OR TYPE DESIG.
3568899 | | | | 16. LOT NO.
NA | | | |
| 17. EFFECT ON COST/PRICE
None | | | | 18. EFFECT ON DELIVERY SCHEDULE
10-12 month in F1 SMA delivery if disappro | | | |
| 19. EFFECT ON INTEGRATED LOG/SVC SUPPORT, INTERFACE, ETC.
None | | | | 20. EFFECT ON DELIVERY SCHEDULE
10-12 month in F1 SMA delivery if disappro | | | |
| 21. DESCRIPTION OF DEVIATION/WAIVER | | | | | | | |

Mirror is cracked at Flex Pivot area on front surface. Crack is ~0.20 inch long extending in from mirror edge. The crack exists over the supporting wall. By machining a slot in the face sheet (Per HP1-26) crack propagation could be prevented. Reference QASR 241542 and 314687 NCMR 316768 and 275536. In addition there will be a small area ~.2 x .05 inch at the edge which will exceed the flatness requirements (~.001 deep). This waiver permits S/N 005 mirror to be reworked to the modification described in the attachment and to proceed to completion.

Cont Page 2

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22. REASON FOR DEVIATION/WAIVER

If mirror is unacceptable, a new mirror for F-1 will have to be ordered. This will result in a severe schedule slip.

REA

Prepared by E. Gossett

23. PRODUCTION EFFECTIVITY BY SERIAL NUMBER

S/N 004 F-1 Model

24. SUBSTITUTING ACTIVITY AUTHORITY & SIGNATURE
12 JUN 80
25. TITLE
SYSTEM ENG MGR.

26. APPROVAL/DISAPPROVAL
☐ APPROVAL RECOMMENDED
☒ APPROVED
☐ DISAPPROVED

27. GOVERNMENT ACTIVITY
NASA - GSFC
28. SIGNATURE
R. B. Lott
29. DATE
6/13/80

DD FORM 1694

80.03-13 70.412

RDW Continuation W 044

23. Continued

Option 1: No Rework

Crack is in flex area which experiences the highest stress level the mirror will see. There is a chance the crack could propagate during launch operation. There is a further chance that a catastrophic failure could occur. If crack propagation does not occur performance will be much like that discussed in Option 2 except for the effects of the stop hole.

Option 2: Rework by machining a slot.

This will prevent crack propagation. Performance will be affected. The slot used to stop the crack will cause some light loss (about $7 \times 10^{-3}\%$) and will cause some scan modulation (about $6 \times 10^{-4}\%$). The region around the crack will not have as much stiffness as an undamaged mirror and this area will probably not hold the surface figure as well. But this area is usually distorted to some degree by the flex pivot mount anyway. This effect will probably be small and will involve not more than approximately .5% of the mirror area.

Final Acceptance should be performed after final polish to insure sufficient stability is achieved in the region of interest.

Rework Instructions

Repair to Variation: Machine (ELOX per HP1-26) a slot approximately 0.10" wide, deep enough and long enough (approximately 0.25" and rounded at the end) to completely remove the crack. Determine part to be free of crack by Zygo dye penetrant inspection.

During replating, mask back of crack area to prevent stripping operation from leaching or etching the plating from underneath.

System performance effects are discussed under Option 2.

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Page 1 of 6

REQUEST FOR DEVIATION/WAIVER
(SEE MIL-STD-460 OR 461 FOR INSTRUCTIONS)

DATE PREPARED
26 November 1980

PRECEDENCE ACTIVITY NO.

1. ORIGINATOR NAME AND ADDRESS

Hughes Aircraft Company, Culver City, Ca

2. ☐ DEVIATION ☒ WAIVER
3. ☐ MINOR ☒ MAJOR ☐ CRITICAL

4. DESIGNATION FOR DEVIATION/WAIVER

1. MFR. CODE 82577 2. SYS. DESIG. HS-236 3. DEV. CODE W070

5. PAGE LINE AFFECTED

☐ PAGE ☐ ALL ☒ PRE-
1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.

6. OTHER SYSTEMS/CONF. RATION ITEMS AFFECTED

☐ YES ☒ NO

7. SPECIFICATIONS AFFECTED-TEST PLAN

1. MFR. CODE 82577 2. SPEC. / DOC. NO. 3569000 3. REV. D 4. MOD. NO. 3568977 5. REV. F

8. DRAWINGS AFFECTED

1. MFR. CODE 82577 2. DRAWING NO. 3569000 3. REV. D 4. MOD. NO. 3568977 5. REV. F

9. TITLE OF DEVIATION/WAIVER

Negligible outgassing from non-space qualified polysulfide mat'l

10. CONTRACT NO. & LINE ITEM

11. IDENTIFICATION TYPE AND NUMBER

Scan mirror assembly 3533002-100

12. CS NO. 13. DEFECT NO. 14. DEFECT CLASSIFICATION

☒ MINOR ☐ MAJOR ☐ CRITICAL

15. NAME OF PART OR LATEST ASSEMBLY AFFECTED

SAM Electronic Assembly 3569000
SMA Interface Harness Assy 3568977

17. LOT NO. 18. QTY

n/a 356

19. EFFECT ON COST/PRICE

1 month slip on PF SMA delivery

20. EFFECT ON INTEGRATED LOGISTIC SUPPORT, INTERFACE, ETC.

23. DESCRIPTION OF DEVIATION/WAIVER

As per attachment "when the outgassing problem with polysulfide was identified the EM SMA had been delivered to SBRC, and the LTM SMA was in assembly". Corrective action was then taken to remove or overcoat the minute quantities of polysulfide where practical. See attached report.

NOTE: HP16-103, Type 6, polysulfide was on the early versions of the approved parts and materials list but has since been deleted.

24. BASIS FOR DEVIATION/WAIVER

To remove entirely all small quantities of polysulfide rather than overcoating it with a non-outgassing material would require disassembling the SMA, reworking, reassembling and retesting. This would cause a major schedule slippage and induce a budgetary burden deemed unjustifiable by investigation.

Sys. Eng.

REA

Prepared by:

QA

PE

25. PRODUCTION EFFECTIVITY BY SERIAL NUMBER

S/N 002, 003, and 004,005

26. IDENTIFIED ACTIVITY AND DATE OF IDENTIFICATION

H. D. Nichols

Associate Program Manager TM

27. APPROVAL/DISAPPROVAL

☐ APPROVAL RECORDED

☒ APPROVED ☐ DISAPPROVED

28. IDENTIFIED ACTIVITY

Landsat - D P.O.

SIGNATURE DATE
Oscar Weinstein 12/10/80

DD FORM 1694

Q. KATJ
70-41-10
81-01-06

Use of Polysulfide on SMA Assy

The original SMA design called for polysulfide in the following places:

- 1) At every connector/harness interface to serve as a strain relief.
- 2) In the SME on item 3568972 (Interface Harness Assy and Cover)
- 3) In the SAM electronics, item 3569000

When the problem with polysulfide was identified, the engineering model SMA had been delivered to SBRC and life test was in assembly. Corrective action was initiated to remove or overcoat the polysulfide where practical. The following is a tabulation of all SMA's and their status:

| POLYSULFIDE LOCATION AND CONDITION | | | | |
|------------------------------------|---------------|--------------------------------|------------|---------|
| S/N | SMA
MODEL | CONNECTOR/HARNESS
INTERFACE | SME | SAM |
| 1 | ENGINEERING * | Exposed | Exposed | Exposed |
| 2 | LIFE TEST | Removed | Exposed | Exposed |
| 3 | PROTOFLIGHT | Removed | Overcoated | Exposed |
| 4 | FLIGHT | Removed | Overcoated | Exposed |
| 5 | SPARE | REMOVED | OVERCOATED | EXPOSED |

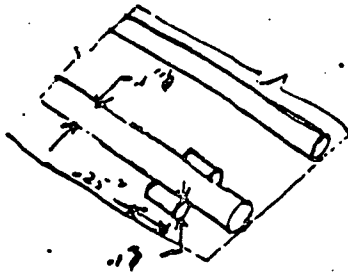
The polysulfide which remains on the Life Test, Protoflight and Flight models is used to tack wires to circuit boards, bond temperature sensors, or overcoat screw threads. The following sketches show the assumptions made for estimating the amount of polysulfide used.

* For information only

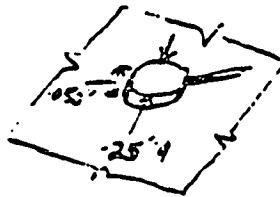
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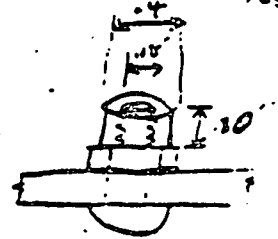
W070
Page 3



Tacking Wires



Bonding Temp Sensors



Overcoat Screws

assuming 2 cylindrical tacks per wire the mass per wire is

$$PVol/Wire = 16 \text{ gms/in}^3 [2(\pi/4) (.1)^2 (.25)] = \underline{.06 \text{ grams/wire}}$$

assuming a disc shaped bond line for the temp sensor, the mass is

$$16 \text{ gms/in}^3 [\pi/4 (.25)^2 (.05)] = \underline{.04 \text{ grams/temp sensor}}$$

assuming an annular cylinder of material to overcoat the screw threads the mass is

$$16 \text{ gms/in}^3 [\pi/4 ((.4)^2 - (.18)^2) .10] = \underline{.16 \text{ grams/screw}}$$

On the SME there are 90 wires tacked and 15 screws overcoated, therefore, the total mass is

$$90(.06) + 15(.16) = \underline{8 \text{ grams}}$$

On the SAM there are 40 wires tacked, 4 screws overcoated, and 1 temp sensor bonded, the total mass is

$$40(.06) + 4(.16) + 1(.04) = \underline{3 \text{ grams}}$$

- On the Life Test Model there is a total of $8 + 3 = 11$ grams of polysulfide exposed.

- On the Protoflight and Flight Models there is a total of 3 grams of polysulfide exposed.

A contamination analysis of the life test chamber was performed by Dr. Don Smith after the Life Test SMA had been in a hard vacuum ($P \leq 1 \times 10^{-5}$ TORR) off & on for several weeks. The results showed no trace of polysulfide anywhere in the chamber. As requested by Dr. Predmore of NASA, a spectral analysis of HP16-103, Type VI, material is in progress.

The absence of polysulfide on the chamber walls indicates that any outgassing that did occur was contained within the SME or SAM electronics box. Recall that the Life Test Model has ≈ 4 times the amount of polysulfide than does the Protoflight or Flight Model.

In addition, any polysulfide that does escape will tend to adhere to the SMA cover or the backside of the SMA. The potential problem here is that it may adhere to SAM optics and degrade the SAM signal levels. However, polysulfide does not have an absorption peak near the $.8 \mu\text{m}$ wavelength of the SAM emitters and, therefore, this is not a problem.

The only way any polysulfide material could migrate to critical optics is through the gap between the scan mirror and the SMA frame. The presence of polysulfide in the SAM electronics is really not a problem for the following reasons:

- 1) There is such a minute amount present, ≈ 3 grams
- 2) The SMA operational temperature range is controlled to $24 \pm 2^\circ\text{C}$. There is no system requirement or test planned that exceeds these limits in vacuum.
- 3) SAM signal levels will not be affected by the presence of polysulfide molecules on the optics.
- 4) The source is located in back of the scan mirror and is aimed at the SMA housing wall.
- 5) There is experimental evidence that the polysulfide never escapes the electronics box.

HUGHES

AVOID VERBAL ORDERS

W070
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| | | | | | | | | | |
|---------|---|-------------|------------|-------|-----|-----|------|------|----------|
| TO | D. C. SMITH | SOURCE CODE | 761 211 20 | BLDG. | 316 | M/S | R129 | EXT. | 2245 |
| FROM | C. D. WORTHAMS | SOURCE CODE | 761 211 12 | BLDG. | 6 | M/S | D129 | EXT. | 6614 |
| SUBJECT | CONTAMINATION SAMPLES TAKEN FROM THE THEMATIC MAPPER VACUUM CHAMBER | | | | | | | DATE | 11/26/60 |

THE THEMATIC MAPPER VACUUM CHAMBER WAS SAMPLED BY D. C. SMITH BY WASHING WITH SPECTROGRADE SOLVENTS AND SWABBING WITH BLANKED COTTON BALLS AND TEX WIPES. THE CONTAMINANTS WERE EXTRACTED FROM THE WASHINGS, COTTON BALLS AND TEX WIPES AND ANALYZED BY THE FOURIER TRANSFORM INFRARED SPECTROPHOTOMETER. THE RESULTS OF THE ANALYSES ARE OUTLINED BELOW.

| SAMPLE | RESULTS |
|---------------------|---------------------------------------|
| HEXANE WASH OF CRYO | ALIPHATIC ESTER AND DIETHYL PHTHALATE |
| PUMP INNER SHIELD | ARE IDENTIFIED BY FTIR. |

| | |
|--|--|
| LIQUID FROM INSIDE THE SHIELD OF CRYO PUMP | LIQUID IS IDENTIFIED AS WATER BY MASS SPECTROMETER. MAJOR ORGANIC COMPONENT OF THE EXTRACT IS γ -CAPROLACTAM BY FTIR. |
|--|--|

| | |
|----------------------------|--|
| CRYO PUMP - CHEVIAR BAFFLE | AROMATIC ESTER AND METHYL SILICONE ARE IDENTIFIED BY FTIR. |
|----------------------------|--|

| | |
|----------------------------|--|
| LIFE TEST CHAMBER - INSIDE | 3.7 MG PER 7.1 FT ² OR 0.5 MG/FT ² OF NYR; |
| METAL DOME, 19' X 54' AREA | ALIPHATIC ESTER AND METHYL SILICONE ARE |
| SAMPLED | IDENTIFIED BY FTIR. |

Continued next page
SIGNATURE

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HUGHES

AVOID VERBAL ORDERS

W070
Page 6 of 6



2

| TO | SOURCE CODE | BLOG. | M/S | EXT. |
|--|-------------|-------|-----|-------|
| D. C. SMITH | | | | |
| FROM | SOURCE CODE | BLOG. | M/S | EXT. |
| C. D. WERTHAM | | | | |
| SUBJECT | | | | DATE |
| - THEMATIC MAPPER VACUUM CHAMBER - CONTINUED - Pg. 2 | | | | 1 - 1 |

SAMPLE

RESULTS

LIFE TEST CHAMBER, SAM 4.9 MG PER 1.5 FT² OR 3.3 MG/FT²
ELECTRONICS, 1.5 FT² AREA SAMPLED OF NVR; NVR IS IDENTIFIED AS
ALIPHATIC ESTER AND METHYL SILICONE

DATA STATION CHAMBER, SAM 1.6 MG PER 1.5 FT² OR 1.1 MG/FT²
ELECTRONICS, 1.5 FT² AREA OF NVR; NVR IS IDENTIFIED AS
SAMPLED METHYL SILICONE, ALIPHATIC ESTER
AND A TRACE OF AN AMINE

DATA STATION CHAMBER, MAG 9.5 MG PER 3 FT² OR 3.2 MG/FT²
FIXTURE, 3 FT² AREA SAMPLED OF NVR; ANALYSIS BY FTIR DISCLOSE
THE PRESENCE OF ALIPHATIC ESTER
AND METHYL SILICONE

YELLOW PLASTIC IDENTIFIED AS TEREPHTHALATE

CLEAR PLASTIC IDENTIFIED AS A POLYESTER TYPE
MATERIAL (ESSENTIALLY AN UNKNOWN)

SPECTRA OF BOTH COMPONENTS OF THE POLYSULFIDE MATERIAL (CAST PRO-
SEAL DIVISION MIL-S-8822) WERE EXAMINED CLOSELY. NONE OF THE CONTAMINANT
EXTRACTED CONTAINED ANY POLYSULFIDE MATERIAL.

Chris Wertham
SIGNATURE

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3

REQUEST FOR DEVIATION/WAIVER
(SEE HIG-STD-488 OR 481 FOR INSTRUCTIONS)

DATE PREPARED

9/24/79

PROCURING ACTIVITY NO.

| | | | | | | | |
|--|-----------------------|-------------------------|----------------------------|---|---|---------------------------------------|---|
| 1. ORIGINATOR NAME AND ADDRESS
Hughes Aircraft
Centinela & Teale | | | | 2. <input checked="" type="checkbox"/> DEVIATION <input type="checkbox"/> WAIVED
3. <input checked="" type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> CRITICAL | | | |
| 4. DESIGNATION FOR DEVIATION/WAIVER | | | | 5. BASE LINE AFFECTED | | | |
| 6. MODEL/TYPE
Th | 7. REF. CODE
82577 | 8. SYS. DESIG.
HS236 | 9. DEV/WAIVER NO.
D-024 | <input type="checkbox"/> FUNC.
TIONAL | <input type="checkbox"/> ALLO-
CATED | <input type="checkbox"/> PROD-
UCT | 10. OTHER SYSTEMS/CONFIG-
URATION ITEMS AFFECTED
<input type="checkbox"/> YES <input type="checkbox"/> NO |
| 7. SPECIFICATIONS AFFECTED-TEST PLAN | | | | 8. DRAWINGS AFFECTED | | | |
| REF. CODE SPEC./DOC. NO. SCH | | | | REF. CODE NUMBER REV. ACP. NO. | | | |
| 9. SYSTEM | | | | 82577 3568980 | | | |
| 10. ITEM | | | | | | | |
| 11. TEST PLAN | | | | | | | |
| 12. TITLE OF DEVIATION/WAIVER
Acceptability of Alternate Wiring on Processor Board | | | | 13. CONTRACT NO. & LINE ITEM
NAS-5-24200 | | | |
| 14. CONFIGURATION ITEM NOMENCLATURE
Scan Mirror Assembly 3533002-100 | | | | 15. CLASSIFICATION OF DEFECT
16. CS NO. 17. DEFECT NO. 18. DEFECT CLASSIFICATION
<input checked="" type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> CRITICAL | | | |
| 19. NAME OF PART OR LARGEST ASSEMBLY AFFECTED
Elect. Comp Assy, Processor 3568980 | | | | 20. LOT NO. 21. QTY. 22. RECURRING DEVIATION/WAIVER
N/A 10 <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO | | | |
| 23. EFFECT ON COST/PRICE
\$1,000,000.00 | | | | 24. EFFECT ON DELIVERY SCHEDULE
Delay PF SMA DEL by 1 year | | | |
| 25. EFFECT ON INTEGRATED LOGISTIC SUPPORT, INTERFACE, ETC. | | | | | | | |
| 26. DESCRIPTION OF DEVIATION/WAIVER
NH5300-4(3A) does not allow use of soldering or jumpering a wire to a component lead. ECA 467148-5 requires adding two jumpers; one from U70-7 to J1-12 and another from U70-9 to J1-11, on the processor board. It is requested this alternate wiring method be allowed on the flight boards already fabricated. | | | | | | | |
| 27. NEED FOR DEVIATION/WAIVER
This alternate wiring would prevent scrappage of all the Processor flight boards with all the mounted components and would avoid a one year delay in Protoflight delivery. | | | | | | | |

R.L. Coon

28. PRODUCTION EFFECTIVITY OR SERIAL NUMBER

SERNO 1 & up

29. REQUESTING ACTIVITY SIGNATURE
R.L. Coon

27. APPROVAL/DISAPPROVAL

| | |
|---|---|
| 30. <input type="checkbox"/> APPROVAL RECOMMENDED | 31. <input checked="" type="checkbox"/> APPROVED <input type="checkbox"/> DISAPPROVED |
| 32. GOVERNMENT ACTIVITY
NASA OAS | 33. SIGNATURE
Leonard E. Austin |
| 34. DATE
9/28/79 | 35. DATE
9/28/79 |

DD FORM 1694

16-41-10 B. Dec 1979-10-02

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516

REQUEST FOR DEVIATION/WAIVER
SEE MIL-STD-400 (A) FOR INSTRUCTIONS

DATE PREPARED

7/16/79

PROCURING ACTIVITY NO.

| | | | | | | | |
|---|--|--|--|--|--|--|--|
| 1. ORIGINATOR NAME AND ADDRESS
Hughes Aircraft Co. | | | | 2. <input checked="" type="checkbox"/> DEVIATION <input type="checkbox"/> WAIVER | | | |
| 3. <input checked="" type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> CRITICAL | | | | 4. OTHER SYSTEMS CONCERNED
RATION ITEMS AFFECTED | | | |
| 5. <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | | | | 6. <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | | | |
| 7. <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | | | | 8. <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | | | |
| 9. <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | | | | 10. <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | | | |
| 11. <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | | | | 12. <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | | | |
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| 15. <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | | | | 16. <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | | | |
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| 21. <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | | | | 22. <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | | | |
| 23. <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | | | | 24. <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | | | |
| 25. <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | | | | 26. <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | | | |
| 27. <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | | | | 28. <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | | | |
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| 95. <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | | | | 96. <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | | | |
| 97. <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | | | | 98. <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | | | |
| 99. <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | | | | 100. <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | | | |

See attached sheet (2)

*Approval by NASA subject to preparation
of representative samples of procedure prior to
use of flight hardware.*

| | |
|---|--|
| 20. REASON FOR DEVIATION/WAIVER | |
| To prevent scrappage of all flight processor boards and to avoid slippage of the delivery schedule for the Protoflight SMA which could be a minimum of 12 weeks for fabrication, assembly and test. | |
| 21. APPROVAL BY DESIGN ENGINEER | |
| SEEN 1 SUP | |
| 22. APPROVAL BY QUALITY ASSURANCE ENGINEER | |
| 23. APPROVAL BY PROJECT MANAGER | |
| 24. APPROVAL BY PROGRAM MANAGER | |
| 25. APPROVAL BY SYSTEMS ENGINEER | |
| 26. APPROVAL BY TEST ENGINEER | |
| 27. APPROVAL BY OPERATIONS ENGINEER | |
| 28. APPROVAL BY MAINTENANCE ENGINEER | |
| 29. APPROVAL BY LOGISTICS ENGINEER | |
| 30. APPROVAL BY SUPPORT ENGINEER | |
| 31. APPROVAL BY OTHER ENGINEER | |
| 32. APPROVAL BY OTHER PERSONNEL | |
| 33. APPROVAL BY OTHER PERSONNEL | |
| 34. APPROVAL BY OTHER PERSONNEL | |
| 35. APPROVAL BY OTHER PERSONNEL | |
| 36. APPROVAL BY OTHER PERSONNEL | |
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| 95. APPROVAL BY OTHER PERSONNEL | |
| 96. APPROVAL BY OTHER PERSONNEL | |
| 97. APPROVAL BY OTHER PERSONNEL | |
| 98. APPROVAL BY OTHER PERSONNEL | |
| 99. APPROVAL BY OTHER PERSONNEL | |
| 100. APPROVAL BY OTHER PERSONNEL | |

R. L. Conklin 7-17-79

NASA-QAR

Donald E. Conklin

7/23/79

DD FORM 1694

20. 4110

79-27-25

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DESCRIPTION OF DEVIATION

NHB 5300.- (JA) does not provide for the use of jumper wires or for deleting portions of the conductors on printed circuit boards. ECR 800298 (attached) and ECR 467161-2 (attached) require the addition of several jumpers and cutting of conductors on the internal and exterior layers of the processor board. This would need to be incorporated on the Protoflight boards at the assembly level and to the remaining eight boards at the detailed board level prior to being bonded to the board heatsink. The requested alterations will be performed with precision drilling equipment augmented by 10 power bore sight aid to accurately position the cutting tool over the designated location. A target will be scribed over the center of the conductor to be broken. Conductor width is .015. The Conductor in all cases is on the second and third layer and is plainly visible when back lighted by a light table. The Protoflight boards will be masked to protect components from debris. The boards will be mounted in their handling fixture throughout these operations to protect the boards from hard surfaces of clamping devices. Rework planning for these changes will include a reasonable level of detail to assure the proper handling and execution of the board modification. If required, planning may be submitted to AFQA review for screening prior to implementation of the board changes.

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518

REQUEST FOR DEVIATION/WAIVER
(SEE MIL-STD-460 OR MIL FOR INSTRUCTIONS)

DATE PREPARED
3/9/79

PROCURING ACTIVITY NO.

| | | | | | | | |
|--|-----------------------|-------------------------|----------------------------|---|---|--|---|
| 1. ORIGINATOR NAME AND ADDRESS
Hughes Aircraft Company | | | | 2. <input checked="" type="checkbox"/> DEVIATION <input type="checkbox"/> WAIVER
3. <input checked="" type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> CRITICAL | | | |
| 4. DESIGNATION FOR DEVIATION/WAIVER | | | | 5. BASE LINE AFFECTED | | 6. OTHER SYSTEMS, CONTIN.
RATION ITEMS AFFECTED | |
| a. MODEL/TYPE
TM | b. MFR. CODE
82577 | c. SYS. DESIG.
HS236 | d. DEV/WAIVER NO.
00009 | <input type="checkbox"/> FUNC-
TIONAL | <input type="checkbox"/> ALLO-
CATED | <input checked="" type="checkbox"/> PROD-
UCT | <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO |
| 7. SPECIFICATIONS AFFECTED-TEST PLAN | | | | 8. DRAWINGS AFFECTED | | | |
| a. SYSTEM | | | | b. MFR. CODE | c. NUMBER | d. REV. | e. NOB. NO. |
| b. ITEM | | | | 82577 | 3568980 | A | |
| c. TEST PLAN | | | | | | | |
| 9. TITLE OF DEVIATION/WAIVER
Acceptability of jumper wires on processor PC boards | | | | | | 10. CONTRACT NO. & LINE ITEM
NAS5-24200 | |
| 11. CONFIGURATION ITEM NOMENCLATURE
Scan Mirror Assembly 3533002-100 | | | | 12. CD NO. | | | |
| 13. NAME OF PART OR LATEST ASSEMBLY AFFECTED
Processor Board Assembly | | | | 14. DEFECT CLASSIFICATION
<input checked="" type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> CRITICAL | | 15. DEFECT NO. | |
| 16. PART NO. OR TYPE DESIG.
3568980 | | | | 17. LOT NO.
N/A | | 18. QTY
10 | |
| 19. EFFECT ON COST/PRICE
\$25,000.00 | | | | 20. RECURRING DEVIATION/WAIVER
<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO | | | |
| 21. EFFECT ON DELIVERY SCHEDULE
Delay PF by 4 to 6 weeks | | | | | | | |
| 22. EFFECT ON INTEGRATED LOGISTIC SUPPORT, INTERFACE, ETC. | | | | | | | |
| 23. DESCRIPTION OF DEVIATION/WAIVER | | | | | | | |

NHB 5300.4(3A) does not allow use of jumper wires on printed circuit boards. ECR 800634 (attached) shows how the rework will be accomplished on flight if this request is approved for the flight boards which are being completed in fabrication. This rework will comply with procedure DP 50234.

24. NEED FOR DEVIATION/WAIVER

The deviation to use a jumper would prevent scrappage of the SME flight processor boards soon to be delivered from fabrication and would forestall a slippage of protoflight SMA delivery by 4 to 6 weeks.

FILE COPY

R.L. Coon
R.L. Coon

| | |
|---|--|
| 25. PRODUCTION EFFECTIVITY BY SERIAL NUMBER
S/N 001 (Eng Model) and up | |
| 26. SUBMITTING ACTIVITY AUTHORIZING SIGNATURE
T. Van Horne | |
| 27. APPROVAL/DISAPPROVAL | |
| 28. APPROVAL RECOMMENDED <input type="checkbox"/> DISAPPROVED <input checked="" type="checkbox"/> | |
| 29. GOVERNMENT ACTIVITY
NASA/GSEC QAR | |
| 30. SIGNATURE
<i>Edward E. ...</i> | |
| 31. DATE
3/19/79 | |
| DD FORM 1694 | |

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519

(3)

| | | | | | | | | | | | | | | | | | | | |
|--|--------------------|---------------------------------------|-----------------------|--|--|--|------|--|-------|-------|----------|-----------|---|--|--|--------|--|--|--|
| HUGHES
<small>HUGHES AIRCRAFT COMPANY</small>
CODE IDENT 11977 | | REQUEST FOR DEVIATION/WAIVER | | | | REQUEST NO 50765 | | | | | | | | | | | | | |
| | | | | | | CONTROL NO. 0019 | | | | | | | | | | | | | |
| TITLE
ACCEPTABILITY OF LEAD TO LEAD SOLDER
CONNECTION ON TORQUE DR BOARD | | | | PROGRAM
HS 236 | | SM 1 OF 2 REV -- | | | | | | | | | | | | | |
| SYM/EOPT NAME/DESIGNATION
SCAN MIRROR ASSY | | CONTROL ITEM NO.
3533002-100 | | CONTRACT NO.
NAS 5-24200 | | <table border="1"> <tr> <td></td> <td>MINOR</td> <td>MAJOR</td> <td>CRITICAL</td> </tr> <tr> <td>DEVIATION</td> <td>X</td> <td></td> <td></td> </tr> <tr> <td>WAIVER</td> <td></td> <td></td> <td></td> </tr> </table> | | | MINOR | MAJOR | CRITICAL | DEVIATION | X | | | WAIVER | | | |
| | MINOR | MAJOR | CRITICAL | | | | | | | | | | | | | | | | |
| DEVIATION | X | | | | | | | | | | | | | | | | | | |
| WAIVER | | | | | | | | | | | | | | | | | | | |
| PART OR LOWEST ASSEMBLY AFFECTED
3568985 | | | | OLVT SCHED/LOGISTIC SPRT/COST
<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO | | RECURRING
<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO | | | | | | | | | | | | | |
| QTY | CONTROL ITEM SERNO | LOT NO. | SPEC/DWG/STD AFFECTED | REQUESTED BY | | ORG CODE | DATE | | | | | | | | | | | | |
| 10 | 5 / 24200 | N/A | 3568985 | R.L. Coon | | | | | | | | | | | | | | | |
| DESCRIPTION
<p> NES 5300.4 (3A) does not provide for soldering a component lead to another component lead. The ECR 800454 is requesting the additional a 0.1 uf ceramic capacitor between two existing resistors R89 & R91. The capacitor will be bonded to the board. The attached EO's show how this change would be accomplished. It is requested this rework be allowed on the flight boards which have been fabricated and the two protoflight boards in assembly. Reference Fig. E-3 of DP 50234 Rev - </p> | | | | | | | | | | | | | | | | | | | |
| NEED
<p> To prevent schedule slip of all the flight torque drive boards & to prevent slippage of Protoflight SMA schedule. </p> | | | | | | | | | | | | | | | | | | | |
| APPROVALS | | | | | | | | | | | | | | | | | | | |
| ORG CODE
77-35 | | DATE
7-12-79 | | ORG CODE
44-29 | | DATE
7-12-79 | | | | | | | | | | | | | |
| RESPONSIBLE ENGRG
R.L. Coon | | CUSTOMER
W.D. Herd by R.C. Bennett | | | | | | | | | | | | | | | | | |
| RELEASE AUTHORIZATION | | | | | | | | | | | | | | | | | | | |
| ENGRG CHG CTR
R.L. Coon | | ORG CODE
77-35 | | DATE
79-07-15 | | RELEASE ACT
R.L. Coon | | | | | | | | | | | | | |
| | | ORG CODE
70-01-00 | | DATE
79-07-15 | | | | | | | | | | | | | | | |

#3

REQUEST FOR DEVIATION/WAIVER
(SEE MIL-STD-460 OR 461 FOR INSTRUCTIONS)

DATE PREPARED
4/24/79

PROCURING ACTIVITY NO.

| 1. ORIGINATOR NAME AND ADDRESS
HUGHES AIRCRAFT COMPANY | | | | 2. <input checked="" type="checkbox"/> DEVIATION <input type="checkbox"/> WAIVER | | | | | | | | | | | | | | | |
|--|------------------------------|---------------------------------|-----------------------------------|---|----------------|----|--|--|--|--|--|-----------|--------|------|----------|--------------|----------------|--|--|
| | | | | 3. <input checked="" type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> CRITICAL | | | | | | | | | | | | | | | |
| 4. DESIGNATION FOR DEVIATION/WAIVER | | | | 5. BASE LINE AFFECTED | | | | | | | | | | | | | | | |
| 6. MODEL/TYPE
TM | 7. MFR. CODE
82577 | 8. SYS. DESIG.
HS-236 | 9. DEV/WAIVER NO.
00011 | <input type="checkbox"/> FUNCTIONAL <input type="checkbox"/> ALLOCATED <input type="checkbox"/> PRODUCT <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | | | | | | | | | | | | | | | |
| 7. SPECIFICATIONS AFFECTED-TEST PLAN | | | | 8. OTHER SYSTEMS/CONFIGURATION ITEMS AFFECTED | | | | | | | | | | | | | | | |
| <table border="1"> <tr> <th>MFR. CODE</th> <th>SPEC./DOC. NO.</th> <th>SN</th> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table> | | | | MFR. CODE | SPEC./DOC. NO. | SN | | | | <table border="1"> <tr> <th>MFR. CODE</th> <th>NUMBER</th> <th>REV.</th> <th>FOR. NO.</th> </tr> <tr> <td>82577</td> <td>3568985</td> <td></td> <td></td> </tr> </table> | | MFR. CODE | NUMBER | REV. | FOR. NO. | 82577 | 3568985 | | |
| MFR. CODE | SPEC./DOC. NO. | SN | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| MFR. CODE | NUMBER | REV. | FOR. NO. | | | | | | | | | | | | | | | | |
| 82577 | 3568985 | | | | | | | | | | | | | | | | | | |
| 9. TITLE OF DEVIATION/WAIVER
Acceptability of Jumper Wire on Torque Drive PC Board | | | | 10. CONTRACT NO. & LINE ITEM
NASS-24200 | | | | | | | | | | | | | | | |
| 11. CONFIGURATION ITEM NOMENCLATURE
Scan Mirror Assembly 3533002-100 | | | | 12. CD NO. | | | | | | | | | | | | | | | |
| 13. NAME OF PART, OR LATEST ASSEMBLY AFFECTED
Electronic Component Assembly Torque Drive Board | | | | 14. DEFECT CLASSIFICATION
<input checked="" type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> CRITICAL | | | | | | | | | | | | | | | |
| 15. PART NO. OR TYPE DESIG.
3568985 | | | | 16. LOT NO.
N/A | | | | | | | | | | | | | | | |
| 17. EFFECT ON COST/PRICE
\$10,000.00 | | | | 18. QTY
10 | | | | | | | | | | | | | | | |
| 19. EFFECT ON INTEGRATED LOGISTIC SUPPORT, INTERFACE, ETC. | | | | 20. RECURRING DEVIATION/WAIVER
<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO | | | | | | | | | | | | | | | |
| 21. EFFECT ON DELIVERY SCHEDULE | | | | | | | | | | | | | | | | | | | |
| 22. DESCRIPTION OF DEVIATION/WAIVER | | | | | | | | | | | | | | | | | | | |

NHB5300.4 (3A) does not allow use of jumper wires on the printed circuit boards. ECR 800290 (attached) shows the rework as it would be accomplished. It is requested that this rework be allowed on the 10 flight boards that have been fabricated.

24. NEED FOR DEVIATION/WAIVER

To prevent slip in delivery of the Protoflight SMA from 2 to 4 weeks and to prevent scrapping all the flight boards that have been fabricated.


R.L. Coon

25. PRODUCTION EFFECTIVITY BY SERIAL NUMBER

SERNO 001 and up

26. SUBMITTING ACTIVITY AUTHORIZING SIGNATURE

T. VanHorne

DATE

W. Herd 5/1/79

CMO

27. APPROVAL/DISAPPROVAL

☒ APPROVAL RECOMMENDED ☒ APPROVED ☐ DISAPPROVED

28. GOVERNMENT ACTIVITY

SIGNATURE

5/2/79

DD FORM 1694

5/1/79

70-41-10 Rev. 79-0502

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521

REQUEST FOR DEVIATION/WAIVER
(SEE MIL-STD-480 OR 481 FOR INSTRUCTIONS)

DATE PREPARED

9/12/79

PROCURING ACTIVITY NO

| | | | | | | | |
|---|--------------------|--|--------------------------|---|------------------------------------|---|---|
| 1. ORIGINATOR NAME AND ADDRESS
Hughes Aircraft
Centinela & Teale | | | | 2. <input checked="" type="checkbox"/> DEVIATION <input type="checkbox"/> WAIVER | | | |
| | | | | 3. <input checked="" type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> CRITICAL | | | |
| 4. DESIGNATION FOR DEVIATION/WAIVER | | | | 5. BASE LINE AFFECTED | | 6. OTHER SYSTEMS/CONFIGURATION ITEMS AFFECTED | |
| MOELL TYPE
TM | MFR. CODE
82577 | SYS. CLSIC.
HS236 | DEV. WAIVER NO.
D-023 | <input type="checkbox"/> FUNCTIONAL | <input type="checkbox"/> ALLOCATED | <input type="checkbox"/> PRODUCT | <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO |
| 7. SPECIFICATIONS AFFECTED-TEST PLAN | | | | 8. DRAWINGS AFFECTED | | | |
| MFR. CODE SPEC./DOC. NO. SCH | | | | MFR. CODE NUMBER REV. NOR. NO. | | | |
| SYSTEM | | | | | | | |
| ITEM | | | | 82577 3568985 C | | | |
| TEST PLAN | | | | | | | |
| 9. TITLE OF DEVIATION/WAIVER
Acceptability of Alternate Wiring on Torque Dr PC Board | | | | | | 10. CONTRACT NO. & LINE ITEM
NAS-5-24200 | |
| CONFIGURATION ITEM IDENTIFICATION
Scan Mirror Assembly, 3533002-100 | | | | 12. CD NO. 13. OBJECT NO. 14. OBJECT CLASSIFICATION | | | |
| | | | | <input checked="" type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> CRITICAL | | | |
| NAME OF PART OR LOWEST ASSEMBLY AFFECTED
Elect. Com. Assy, Torque Dr | | 16. PART NO. OR TYPE DESIGN
3568985 | | 17. LOT NO.
N/A | | 18. QTY
10 | |
| | | | | | | 19. RECURRING DEVIATION/WAIVER | |
| | | | | | | <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO | |
| 20. EFFECT ON COST/PRICE
\$25,000 | | | | 21. EFFECT ON DELIVERY SCHEDULE
Delay PF-SMA Del by 1 year | | | |
| 22. EFFECT ON INTEGRATED LOGISTIC SUPPORT, INTERFACE, ETC. | | | | | | | |

DESCRIPTION OF DEVIATION/WAIVER

NHB5300-4(3A) does not allow use of soldering or jumpering a wire or component lead to another component lead. ECR 864766 request a capacitor be added by soldering one lead to the lead of R86 and jumpering the other capacitor lead to the ground end of R90. It is requested this alternate wiring method be allowed on the 8 flight boards already fabricated and assembled.

NOTE: CHANGE HAS BEEN INCORPORATED AND TESTED IN ENGR. MODEL
9/12/79
[Signature]

24. NEED FOR DEVIATION/WAIVER

This would prevent scrappage of all of the Torque Drive flight boards with all mounted components and would prevent a one year delay in Protoflight delivery.

[Signature]
9/12/79

| | |
|---|---|
| 25. PRODUCTION EFFECTIVITY BY SERIAL NUMBER
SERNO 1 & UP | |
| 26. SIGNATURE
<i>[Signature]</i> | |
| 27. APPROVAL/DISAPPROVAL | |
| <input type="checkbox"/> APPROVAL RECOMMENDED | <input checked="" type="checkbox"/> APPROVED <input type="checkbox"/> DISAPPROVED |
| GOVERNMENT ACTIVITY
NADA | SIGNATURE
<i>[Signature]</i> DATE |

7D. REC 1694

50-05-16 70-41-10 GPO. 1969 - 448-746/018

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522

REQUEST FOR DEVIATION/WAIVER
(SEE MIL-STD-480 OR 481 FOR INSTRUCTIONS)

DATE PREPARED

6/26/79

PROCURING ACTIVITY NO.

| | | | | | | | |
|--|-----------------------|--|---------------------------|---|--|--|--|
| 1. ORIGINATOR NAME AND ADDRESS
Hughes Aircraft Company | | | | 2. <input checked="" type="checkbox"/> DEVIATION <input type="checkbox"/> WAIVER | | | |
| | | | | 3. <input checked="" type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> CRITICAL | | | |
| 4. DESIGNATION FOR DEVIATION/WAIVER | | | | 5. BASE LINE AFFECTED | | | |
| 6. MODEL/TYPE
TM | 7. MFR. CODE
82577 | 8. SYS. DESIG.
HS236 | 9. DEV/WAIVER NO.
0017 | <input type="checkbox"/> FUNC. TIONAL <input type="checkbox"/> ALLO-CATED | | <input checked="" type="checkbox"/> PROD-UCT | |
| | | | | 6. OTHER SYSTEMS/CONFIGURATION ITEMS AFFECTED
<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | | | |
| 7. SPECIFICATIONS AFFECTED-TEST PLAN | | | | 8. DRAWINGS AFFECTED | | | |
| MFR. CODE | | SPEC./DOC. NO. | | MFR. CODE | | NUMBER | |
| | | | | 82577 | | 3568990 | |
| 9. SYSTEM | | | | | | | |
| 10. ITEM | | | | | | | |
| 11. TEST PLAN | | | | | | | |
| 12. TITLE OF DEVIATION/WAIVER
Acceptability of Jumper Wires on I/F PC Boards | | | | 13. CONTRACT NO. & LINE ITEM
NAS-S-24200 | | | |
| 14. CONFIGURATION ITEM IDENTIFICATION | | | | 15. CLASSIFICATION BY SEVERITY | | | |
| Scan Mirror Assembly 3533002-100 | | | | 16. DEFECT CLASSIFICATION
<input checked="" type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> CRITICAL | | | |
| 17. NAME OF PART OR LOWEST ASSEMBLY AFFECTED
Electronic Component Assy Interface, S/W | | 18. PART NO. OR TYPE DESIG.
3568990 | | 19. LOT NO.
N/A | | 20. QTY
5 | |
| 21. EFFECT ON COST/PRICE
Increase Cost By \$5,000 | | | | 22. EFFECT ON DELIVERY SCHEDULE
Delay PE-SMA by 10 weeks | | | |
| 23. EFFECT ON INTEGRATED LOGISTIC SUPPORT, INTERFACE, ETC. | | | | | | | |

23. DESCRIPTION OF DEVIATION/WAIVER

NHB5300.4 (3A) does not allow use of jumper wires on printed circuit boards. ECR 800452 (copy attached) shows how this rework would be accomplished. It is requested that this rework be allowed on the 5 Flight boards which have been fabricated, and assembled.

*EO 70535

24. NEED FOR DEVIATION/WAIVER

To prevent scrappage of all flight interface boards and to prevent slippage of the delivery of the Protoflight SMA by 8-10 weeks.

R.L. Coon
R.L. Coon 6/26/79

25. PRODUCTION EFFECTIVITY BY SERIAL NUMBER

S/N 002 and up

26. SUBMITTING ACTIVITY AUTHORIZATION SIGNATURE

27. APPROVAL/DISAPPROVAL

☒ APPROVAL RECOMMENDED *W.D. Havel*
W.D. Havel
☒ APPROVED ☐ DISAPPROVED

28. GOVERNMENT ACTIVITY

NASA OAR

Donald E. Burtis 7/9/79

DD FORM 1694

79-07-12

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523

REQUEST FOR DEVIATION/WAIVER
(SEE MIL-STD-460 OR 461 FOR INSTRUCTIONS)

DATE PREPARED

12/19/79

PROCURING ACTIVITY NO.

| | | | | | |
|---|--------------|---|---|---|---|
| 1. ORIGINATOR NAME AND ADDRESS
Hughes Aircraft Co. (SSD) El Segundo, CA | | | | 2. <input checked="" type="checkbox"/> DEVIATION <input type="checkbox"/> WAIVER | |
| | | | | 3. <input checked="" type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> CRITICAL | |
| 4. DESIGNATION FOR DEVIATION/WAIVER | | 5. BASE LINE AFFECTED | | 6. OTHER SYSTEMS/CONF. CL. RATION ITEMS AFFECTED | |
| a. MODEL/TYPE | b. MFR. CODE | c. SYS. DESIG. | d. DEV/WAIVER NO. | <input type="checkbox"/> FUNCTIONAL <input type="checkbox"/> ALLD. CATED <input type="checkbox"/> PODD. UCT | <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO |
| IM45234 | | D-029 | | | |
| 7. SPECIFICATIONS AFFECTED-TEST PLAN | | | | 8. DRAWINGS AFFECTED | |
| MFR. CODE | | SPEC./DOC. NO. | | MFR. CODE | REV. NO. |
| | | | | 82577 | 3568990 D |
| 9. SYSTEM | | 10. TEST PLAN | | | |
| | | | | | |
| 9. TITLE OF DEVIATION/WAIVER | | | | 13. CONTRACT NO. & LINE ITEM | |
| Acceptability of Jumpering on the Interface Board | | | | NAS 5 - 24200 | |
| 11. CONFIGURATION ITEM NOMENCLATURE | | | | 12. CD NO. | |
| Scan Mirror Assembly 3533002-100 | | | | | |
| 15. NAME OF PART OR LODEST ASSEMBLY AFFECTED | | 16. PART NO. OR TYPE DESIG. | | 17. DEFECT CLASSIFICATION | |
| Interface Elect Comp Assy | | 3568990 | | <input type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> CRITICAL | |
| 18. EFFECT ON COST/PRICE | | 19. EFFECT ON DELIVERY SCHEDULE | | 19. REQUIRING DEVIATION/WAIVER | |
| None | | 12 month schedule impact if disapproved | | <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | |
| 22. EFFECT ON INTEGRATED LOGISTIC SUPPORT, INTERFACE, ETC. | | | | | |
| 23. DESCRIPTION OF DEVIATION/WAIVER | | | | | |
| <p>NHB 5300-4(3A) does not allow use of soldering jumpers to component leads. ECR 873533 requests a change to the Interface Board Assembly which adds six jumpers on the component side of the board. No etch cuts will be necessary. This deviation is requested for permitting this alternate wiring on the flight boards already fabricated.</p> | | | | | |
| 24. NEED FOR DEVIATION/WAIVER | | | | | |
| <p>This alternate wiring would prevent scrappage of all flight quality Interface Boards including all Hi-Rel parts which are assembled on the boards. Design change to PCB is not currently being made due to extreme schedule slippage which would be the result of such a change.</p> | | | | | |
| 25. PRODUCTION EFFECTIVITY BY SERIAL NUMBER | | | | | |
| 26. SUBMITTING ACTIVITY AUTHORIZING SIGNATURE | | | | | |
| <p><i>[Signature]</i> MOR. SYSTEMS ENGR.</p> | | | | | |
| 27. APPROVAL/DISAPPROVAL | | | | | |
| <input type="checkbox"/> APPROVAL RECOMMENDED | | | <input checked="" type="checkbox"/> APPROVED <input type="checkbox"/> DISAPPROVED | | |
| 28. GOVERNMENT ACTIVITY | | | | | |
| <p><i>[Signature]</i> TH/TO 12/20/79</p> | | | | | |

DD FORM 1694 CHANGE INVOLVES NON-CRITICAL TELEMETRY
A. Patch 80-05-22
70-41-80

FILE COPY

[Signature]

12/19/79

REQUEST FOR DEVIATION/WAIVER
(SEE MIL-STD-460 OR 461 FOR INSTRUCTIONS)

DATE PREPARED

3/1/79

PROCURING ACTIVITY NO.

524

1. ORIGINATOR NAME AND ADDRESS

HUGHES AIRCRAFT COMPANY

2. ☒ DEVIATION ☐ WAIVER
3. ☒ MINOR ☐ MAJOR ☐ CRITICAL

4. DESIGNATION FOR DEVIATION/WAIVER

6. MODEL/TYPE
TM
7. MFR. CODE
82577
8. SYS. DESIG.
HS236
9. DEV/WAIVER NO.
DSC 63

5. BASIC LINE AFFECTED

☐ FUNC. TIONAL ☐ ALLO. CATED ☒ PROD. UCT

6. OTHER SYSTEMS/CONFIGURATION ITEMS AFFECTED
☐ YES ☒ NO

7. SPECIFICATIONS AFFECTED-TEST PLAN

8. DRAWINGS AFFECTED
9. MFR. CODE
SPEC./DOC. NO.
SCR
10. MFR. CODE
11. DRAWING NO.
12. REV.
13. NO. NO.

14. SYSTEM
15. ITEM
16. TEST PLAN

9. TITLE OF DEVIATION/WAIVER

Acceptability of jumper wires on SAM PC Boards

10. CONTRACT NO. & LINE ITEM

NAS5-24200

11. CONFIGURATION ITEM NOMENCLATURE

Scan Mirror Assembly 3533002-100

12. CD NO.
13. DEFECT NO.
14. DEFECT CLASSIFICATION
☒ MINOR ☐ MAJOR ☐ CRITICAL

15. EFFECT OF PART OR LATEST ASSEMBLY AFFECTED
Electronic Component Assy,
Scan Angle Monitor
16. PART NO. OR TYPE DESIG.
3569010

17. LOT NO.
N/A
18. QTY
10
19. RECURRING DEVIATION/WAIVER
☒ YES ☐ NO

20. EFFECT ON COST/PRICE

Increase cost by \$6,000.

21. EFFECT ON DELIVERY SCHEDULE

Delay SAM deliveries by 8 wks & PF-SMA by 4

22. EFFECT ON INTEGRATED LOGISTIC SUPPORT, INTERFACE, ETC.

23. DESCRIPTION OF DEVIATION/WAIVER

NHB5300.4(3A) does not allow use of jumper wires on printed circuit boards. ECR826120 (attached) shows the rework accomplished on the Eng. Model SAM. It is requested that this same rework be allowed on the 10 flight boards which have already been fabricated. This rework will comply with procedure DP50234.

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24. REASON FOR DEVIATION/WAIVER

To prevent scrappage of all flight SAM PC Boards and to prevent slippage of delivery of the Protoflight SMA by from 2 to 4 weeks.

FILE COPY

R.L. Coon
R.L. Coon

25. PRODUCTION EFFECTIVITY BY SERIAL NUMBER

S/N 001 (Eng. Model) and up

26. SUBMITTING ACTIVITY AUTHORIZING SIGNATURE

T. VanHorne

27. APPROVAL/DISAPPROVAL
28. APPROVED ☒ DISAPPROVED ☐
29. SIGNATURE
W. Herd
30. DATE
3/12/79
31. ACTIVITY
79-5320

32. GOVERNMENT ACTIVITY

NAS-1694

DD FORM 1694

UAC/Dir 3/13

32. RACK
70-11-10
30-05-16

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Appendix B

Scan Mirror Assembly Acceptance Test Data

Failure Reports

HUGHESSPACE AND COMMUNICATION GROUP
FAILURE REPORT**F 1325**

| | | | | | | | | | | | | | | | |
|---|--|---|--|----------------------------|--|-------------------------------------|--|-----------------------------------|--|-----------------|--|----------------------------|--|--|--|
| 1. PROGRAM NAME AND NUMBER
T.M. HS 236 | | 2. SLA
E330 | | 3. MODEL
F-1 | | 4. DATE OBSERVED
10/24/81 | | 5. DATE RECEIVED
2 3 81 | | | | | | | |
| 6. HARDWARE LEVEL WHEN FAILURE WAS OBSERVED
<input type="checkbox"/> SPACECRAFT <input type="checkbox"/> SUBSYSTEM <input checked="" type="checkbox"/> UNIT <input type="checkbox"/> ASSEMBLY <input type="checkbox"/> SUBASSEMBLY <input type="checkbox"/> MODULE <input type="checkbox"/> MICAM <input type="checkbox"/> CARD <input type="checkbox"/> PART | | | | | | | | | | | | | | | |
| 7. EQUIPMENT IDENTIFICATION | | NAME | | PART NUMBER | | LN | | MANUFACTURER | | | | | | | |
| 8. SUBSYSTEM | | | | | | | | | | | | | | | |
| 9. UNIT | | | | | | | | | | | | | | | |
| 10. <input type="checkbox"/> ASSEMBLY <input type="checkbox"/> SUBASSEMBLY <input type="checkbox"/> MODULE <input type="checkbox"/> MICAM <input type="checkbox"/> CARD | | | | | | | | | | | | | | | |
| 11. UT-ER
STATION UNIT | | 3533002-100 | | 4 | | HAC | | | | | | | | | |
| 12. TEST WHEN FAILURE WAS OBSERVED
<input type="checkbox"/> DEVELOPMENT <input type="checkbox"/> QUALIFICATION <input type="checkbox"/> INTEGRATION <input type="checkbox"/> LAUNCH OPERATIONS
<input type="checkbox"/> PROGRESS <input checked="" type="checkbox"/> ACCEPTANCE <input type="checkbox"/> SYSTEM | | | | | | | | | | | | | | | |
| 13. ENVIRONMENT WHEN FAILURE WAS OBSERVED
<input type="checkbox"/> AMBIENT <input type="checkbox"/> RADIATION <input type="checkbox"/> TEMPERATURE <input type="checkbox"/> HUMIDITY <input type="checkbox"/> VIBRATION <input type="checkbox"/> ALTITUDE <input type="checkbox"/> TIME <input type="checkbox"/> STRESS | | | | | | | | | | | | | | | |
| 14. DESCRIPTION OF FAILURE
TELEMETRY READOUT - LINE LENGTH WAS 000 000 000 000
(REV. E 1-26-81) TYP. LINE LENGTH IS 000 377 350 000
FAIL. INITIATION WAS IN F-1 PRE-TEST RUN #1098, 126-AS. 600 REPTD 16/11/81 | | | | | | | | | | | | | | | |
| 15. TEST PROCEDURE
TS 32015 004 147.5.2 | | 16. ORIGINATOR
A. J. J. J. | | 17. DATE
12-2-81 | | 18. CONTINUATION SHEET NO. | | | | | | | | | |
| 19. EVALUATION AND FAILURE ANALYSIS
TELEMETRY TROUBLE PRINTOUT REVEALED THAT NEITHER SERIAL FLUXOR LINE LENGTH DATA WERE BEING RECEIVED. FURTHER INVESTIG. SHOWED THAT THIS LIMITATION CAN ONLY OCCUR FOR CERTAIN INTERNAL FAILURES IN THE DAS (TEST EQUIPMENT). REPAIR HAS BEEN POSTPONED FOR SCHEDULE (NON-DESTRUCTIVE & INTERMITTENT) DAS (TEST EQUIP) | | 20. CONFIRMATION OF DAS OPERABILITY TO BE PERFORMED AFTER EACH DATA COLLECTION (PRINT 1ST & LAST 2 FLUX TABLES & CHECK LINE LENGTH & FLUX OK) BEFORE PROCEEDING. REPAIR DAS INTERMITTENT PERIOD | | | | | | | | | | | | | |
| 21. AUTHORIZATION
[Signature] | | 22. DATE
77-32-11-23-81 | | 23. CONTINUATION SHEET NO. | | | | | | | | | | | |
| 24. REMARKS
REPAIR ACTION TAKEN | | 25. REMARKS | | | | | | | | | | | | | |
| 26. LIST ALL PARTS REPLACED | | 27. REMARKS | | | | | | | | | | | | | |
| PART NUMBER | | DEF SYM | | PART, JT NO | | DATE CODE | | USER | | PROBABLE DEFECT | | ANALYSIS NO. | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| 28. REMARKS | | JRG | | DATE | | 29. RETESTED BY | | JRG | | DATE | | 30. CONTINUATION SHEET NO. | | | |
| 31. CAUSE AND CORRECTIVE ACTION
DAS INTERNAL COMPONENT FAILURE OR INTERMITTENT REPAIR TO BE POSTPONED. REPAIR OUTLINE INV AVO FROM P.P. PRINCE TO AB. MARCHANT, Feb 23, 1981. TESTING WILL INCLUDE INTERNAL DATA CHECK TO CONFIRM VALID DATA BEFORE PROCEEDING TO FOLLOWING TEST. (PRINT SER. FLUX TABLES AT TRKO FILE (6.11). CHECK FOR VALID DATA IN 1ST & LAST TABLES. | | 32. DOCUMENT IMPLEMENTING CORRECTIVE ACTION | | | | | | | | 33. FOR CLOSURE | | | | | |
| 34. BASIC CAUSE OF FAILURE
<input type="checkbox"/> DESIGN <input type="checkbox"/> ENVIRONMENTAL <input type="checkbox"/> DEFECTIVE PARTS <input checked="" type="checkbox"/> TEST EQUIP <input type="checkbox"/> TEST PROC. <input type="checkbox"/> TEST SET UP <input type="checkbox"/> MFG. PROCEDURE <input type="checkbox"/> ASSEMBLY ERROR <input type="checkbox"/> HANDLING <input type="checkbox"/> REPAIR <input type="checkbox"/> UNKNOWN <input type="checkbox"/> DEFECT CODE | | | | | | | | | | | | | | | |
| 35. FAILURE TYPE
<input type="checkbox"/> PRIMARY <input type="checkbox"/> SECONDARY <input type="checkbox"/> UNKNOWN <input type="checkbox"/> NO FAILURE | | 36. FAILURE CLASSIFICATION
<input type="checkbox"/> CRITICAL <input type="checkbox"/> MAJOR <input type="checkbox"/> MINOR <input type="checkbox"/> SAFETY | | | | | | | | | | | | | |
| 37. RESPONSIBLE ENGINEER
[Signature] | | 38. DATE
77-32-11-23-81 | | 39. SPACECRAFT SYSTEM ENGR | | JRG | | DATE | | | | | | | |
| 40. RELIABILITY | | JRG | | DATE | | 41. CUSTOMER TO SUPPLIER | | JRG | | DATE | | | | | |

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HUGHES

SPACE AND COMMUNICATION GROUP
FAILURE REPORT

F 1327

| | | | | | | | | | |
|--|--|--|--|---|--|--|--|----------------------------------|--|
| 1 PROGRAM NAME AND NUMBER
TM HS236 | | 2 E330 | | 3 MODEL F-1 | | 4 TIME OBSERVED 10 AM | | 5 DATE OBSERVED 2 2 81 | |
| 6 HARDWARE LEVEL WHEN FAILURE WAS OBSERVED | | <input type="checkbox"/> SPACECRAFT <input type="checkbox"/> SUBSYSTEM | | <input type="checkbox"/> ASSEMBLY <input type="checkbox"/> MODULE | | <input type="checkbox"/> CARD | | | |
| <input type="checkbox"/> SYSTEM | | <input checked="" type="checkbox"/> UNIT | | <input type="checkbox"/> SUBASSEMBLY | | <input type="checkbox"/> MICAM | | <input type="checkbox"/> PART | |
| 7 EQUIPMENT IDENTIFICATION | | | | | | | | | |
| NAME | | | | PART NUMBER | | LN | | MANUFACTURER | |
| 1 SUBSYSTEM | | | | | | | | | |
| 2 UNIT | | | | 3533002-100 | | 4 | | HAC | |
| 8 <input type="checkbox"/> ASSEMBLY <input type="checkbox"/> SUBASSEMBLY | | | | | | | | | |
| 9 <input type="checkbox"/> MODULE <input type="checkbox"/> MICAM <input type="checkbox"/> CARD | | | | | | | | | |
| 10 OTHER | | | | | | | | | |
| 11 TEST WHEN FAILURE WAS OBSERVED | | | | | | | | | |
| <input type="checkbox"/> DEVELOPMENT | | <input type="checkbox"/> QUALIFICATION | | <input type="checkbox"/> INTEGRATION | | <input type="checkbox"/> LAUNCH OPERATIONS | | | |
| <input type="checkbox"/> IN PROCESS | | <input checked="" type="checkbox"/> ACCEPTANCE | | <input type="checkbox"/> SYSTEM | | <input type="checkbox"/> | | | |
| 12 ENVIRONMENT WHEN FAILURE WAS OBSERVED | | | | | | | | | |
| <input type="checkbox"/> AMBIENT | | <input type="checkbox"/> RADIATION | | <input type="checkbox"/> TEMPERATURE | | <input type="checkbox"/> THERMAL VAC | | <input type="checkbox"/> AS AT | |
| <input type="checkbox"/> ENCLOSURE | | <input type="checkbox"/> VIBRATION | | AXIS FOR | | MIN | | TYPE | |
| 13 DESCRIPTION OF FAILURE | | | | | | | | | |
| FAILURE TFE K, L, N; DATA SHT 4.3.5.2: TURN AROUND TIME EXCEEDED 10590 EBB HRS. LIMITS | | | | | | | | | |
| (2) FAILURE IN SEQ#6 TFE'S | | | | | | | | | |
| 14 TEST PROCEDURE TS 32015-004 14351 | | | | | | | | | |
| ORIGINATOR R. SCHREINER | | | | DATE 77-11-23 | | TIME 2-281 | | | |
| 15 VERIFICATION AND FAILURE ANALYSIS | | | | | | | | | |
| Failure: frame to data station picture chain under 1.5 miles | | | | | | | | | |
| track, signal down 1.5 miles. The chain value has been corrected | | | | | | | | | |
| (corrected turn-around time). Also Relay Mirror Position non-optimum | | | | | | | | | |
| 16 FOLLOWING REMARKS, RETEST REQUIRED | | | | | | | | | |
| REPORT TFE-H OF TS 32015-004 & PROCEED | | | | | | | | | |
| REF HS236-2043, @ AS SEQUENCE#6 | | | | | | | | | |
| 17 AUTHORIZATION R.R. Prince | | | | | | | | | |
| 18 CONTINUATION SHEET USED | | | | | | | | | |
| 19 CAUSE AND CORRECTIVE ACTION | | | | | | | | | |
| DONE | | | | | | | | | |
| 20 LIST ALL PARTS REPLACED | | | | | | | | | |
| PART NUMBER | | QTY SYN | | PART LOT NO | | DATE CODE | | USER | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| 21 REMARKS | | | | | | | | | |
| BY | | ORG | | DATE | | RETESTED BY | | DATE | |
| | | | | | | | | | |
| 22 CAUSE AND CORRECTIVE ACTION | | | | | | | | | |
| ECR #64797 GENERATED TO INCLUDE SHIM PROCEDURES IN | | | | | | | | | |
| DP 50647 & TS 32015-004, S/N 5 & UP - TEST | | | | | | | | | |
| PERFORMER MADE AWARE OF SENSITIVITY TO SHIMS & TORQUE | | | | | | | | | |
| REV B = DD DP 50647 TO MORE NEARLY | | | | | | | | | |
| OPTIMIZE RELAY MIRROR POINT (TATA APRGX = TATB) | | | | | | | | | |
| SER NO 5 & UP; AS PER WAGER SER #4 USE AS IS | | | | | | | | | |
| 23 DOCUMENT IMPLEMENTING CORRECTIVE ACTION | | | | | | | | | |
| ECR #64797, HS236-2043; ECR #900612 | | | | | | | | | |
| 24 BASIC CAUSE OF FAILURE | | | | | | | | | |
| <input type="checkbox"/> DESIGN | | <input type="checkbox"/> TEST EQUIP | | <input type="checkbox"/> MFG. PROCEDURE | | <input type="checkbox"/> WIRING ERROR | | <input type="checkbox"/> UNKNOWN | |
| <input type="checkbox"/> ENVIRONMENTAL | | <input type="checkbox"/> TEST PROC. | | <input type="checkbox"/> ASSEMBLY ERROR | | <input type="checkbox"/> ROUGH HANDLING | | <input type="checkbox"/> | |
| <input type="checkbox"/> DEFECTIVE PARTS | | <input type="checkbox"/> TEST SETUP | | <input type="checkbox"/> WORKMANSHIP | | <input type="checkbox"/> WEAR OUT | | <input type="checkbox"/> | |
| 25 FAILURE MODE | | | | | | | | | |
| <input type="checkbox"/> PRIMARY | | <input type="checkbox"/> SECONDARY | | <input type="checkbox"/> | | <input type="checkbox"/> | | <input type="checkbox"/> | |
| <input type="checkbox"/> NOISED | | <input type="checkbox"/> | | <input type="checkbox"/> | | <input type="checkbox"/> | | <input type="checkbox"/> | |
| 26 FAILURE CLASSIFICATION | | | | | | | | | |
| <input type="checkbox"/> CRITICAL | | <input type="checkbox"/> | | <input type="checkbox"/> | | <input type="checkbox"/> | | <input type="checkbox"/> | |
| <input type="checkbox"/> | | <input type="checkbox"/> | | <input type="checkbox"/> | | <input type="checkbox"/> | | <input type="checkbox"/> | |
| 27 RESPONSIBLE ENGINEER | | | | | | | | | |
| R.R. Prince | | DATE 77-11-23 | | DATE 77-11-23 | | DATE 77-11-23 | | DATE 77-11-23 | |
| 28 RELIABILITY | | | | | | | | | |
| DATE | | DATE | | DATE | | DATE | | DATE | |
| | | | | | | | | | |

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HUGHES

SPACE AND COMMUNICATION GROUP

FAILURE REPORT

F 1329

| | | | | | | | | | |
|---|--|--|--|--|--|--------------------------------|--|--|--|
| 1 PROGRAM NAME AND NUMBER
TM HS236 | | 2 SLA
E330 | | 3 MODEL
F-1 | | 4 TIME OBSERVED
1500 | | 5 DATE OBSERVED
2 4 81 | |
| 6 HARDWARE LEVEL WHEN FAILURE WAS OBSERVED
<input type="checkbox"/> SPACECRAFT <input type="checkbox"/> SUBSYSTEM <input type="checkbox"/> ASSEMBLY <input type="checkbox"/> MODULE <input type="checkbox"/> CARD | | <input type="checkbox"/> SYSTEM <input checked="" type="checkbox"/> UNIT <input type="checkbox"/> SUBASSEMBLY <input type="checkbox"/> MICAM <input type="checkbox"/> PART | | | | | | | |
| EQUIPMENT IDENTIFICATION | | | | | | | | | |
| 7 SUBSYSTEM | | | | PART NUMBER | | S/N | | MANUFACTURER | |
| 8 UNIT | | | | 3533002-100 | | 4 | | HAC | |
| 9 <input type="checkbox"/> ASSEMBLY <input type="checkbox"/> SUBASSEMBLY | | | | | | | | | |
| 10 <input type="checkbox"/> MODULE <input type="checkbox"/> MICAM <input type="checkbox"/> CARD | | | | | | | | | |
| 11 OTHER | | | | | | | | | |
| 12 TEST WHEN FAILURE WAS OBSERVED
<input type="checkbox"/> DEVELOPMENT <input type="checkbox"/> QUALIFICATION <input type="checkbox"/> VIBRATION <input type="checkbox"/> LAUNCH OPERATIONS
<input type="checkbox"/> PROGRESS <input checked="" type="checkbox"/> ACCEPTANCE <input type="checkbox"/> SYSTEM | | | | | | | | | |
| 13 ENVIRONMENT WHEN FAILURE WAS OBSERVED
<input checked="" type="checkbox"/> AMBIENT <input type="checkbox"/> RADIATION <input type="checkbox"/> TEMPERATURE <input type="checkbox"/> THERMAL / AC <input type="checkbox"/> VIBRATION <input type="checkbox"/> AXIS FOR <input type="checkbox"/> MIN <input type="checkbox"/> MAX <input type="checkbox"/> TYPE <input checked="" type="checkbox"/> AFTER THERMAL <input type="checkbox"/> OTHER | | | | | | | | | |
| 14 DESCRIPTION OF FAILURE
TFE S, L, N: BME 2: REV SCAN OUT OF SPEC. RMS; AN GEOMETRIC B WAS 1.82; 2.07; 2.61: SHOULD BE 1.75 MAX Q
ALSO SMC 1: TFE N. REV SCAN WAS 2.66 | | | | | | | | | |
| 15 TEST PROCEDURE
TS 32015-004 14341 | | 16 ORIGINATOR
R. SCHNEIDER | | 17 DATE
77-11-25 | | 18 TIME
2-6-81 | | 19 CONTINUATION SHEET NO.
1 | |
| 20 PARAPHASE AND FAILURE ANALYSIS
REF HS236-2043; TRANSMISSION OF BUMPER SPRING BOLTS TO SHIM WIL'S & FOLD MIRRORS IS DEPENDENT UPON PROPER INTERFACE SHIM & TORQUE. SHIM W/ 2.5 MILS SHOULD HAVE BEEN 2.5 MILS. THE SHIMS HAVE BEEN CORRECTED.
TORQUE WAS IMPROPER ON INTERFACE BOLTS. | | | | | | | | | |
| 21 FOLLOWING REMARKS REQUIRED
REPEAT TFE-H; REMOVE & REPLACE SHM; CONTINUE UNIT TEST SPEC. FOR FOLLOWING TFE-H PRIOR TO REMOVAL PERFORM ENGINE TEST I SMCUSAMS ONLY; ALONG & CROSS SCAN CRO. REPEATABILITY (P 43532) | | | | | | | | | |
| 22 AUTHORIZATION
P.R. K... | | | | 23 DATE
77-12-11 | | 24 TIME
1423 | | 25 CONTINUATION SHEET USED
1 | |
| 26 REMARKS/RETEST ACTION TAKEN | | | | | | | | | |
| 27 CAUSE AND CORRECTIVE ACTION
TEST PERSONNEL CAUTIONED ABOUT SENSITIVITY TO SHIMS & TORQUE. ECR SUBMITTED FOR SHIM PROCEDURE ADDITION TO DP 50647 & TS 32015-004, S/N 5 & UP | | | | | | | | | |
| 28 DOCUMENT IMPLEMENTING CORRECTIVE ACTION
ECR 564797; EO 13112 | | | | | | | | | |
| 29 BASIC CAUSE OF FAILURE
<input type="checkbox"/> DESIGN <input type="checkbox"/> TEST EQUIP <input type="checkbox"/> MFG. PROCEDURE <input type="checkbox"/> HIRING ERROR <input type="checkbox"/> UNKNOWN
<input type="checkbox"/> ENVIRONMENTAL <input checked="" type="checkbox"/> TEST PROC. <input type="checkbox"/> ASSEMBLY ERROR <input type="checkbox"/> TOUGH HANDLING <input type="checkbox"/> DEFECT CODE
<input type="checkbox"/> DEFECTIVE PARTS <input type="checkbox"/> TEST SET UP <input type="checkbox"/> WORKMANSHIP <input type="checkbox"/> WEAR/OUT | | | | | | | | | |
| 30 FAILURE CLASSIFICATION
<input type="checkbox"/> PRIMARY <input type="checkbox"/> UNKNOWN <input type="checkbox"/> CRITICAL <input type="checkbox"/> MINOR
<input type="checkbox"/> NOUCCED <input type="checkbox"/> NO FAILURE <input type="checkbox"/> MAJOR <input type="checkbox"/> SAFETY | | | | | | | | | |
| 31 RESPONSIBLE ENGINEER
P.R. K... | | | | 32 SPACECRAFT SYSTEM AFFECTED
77-12-11 3643 81 | | 33 DATE
77-12-11 | | 34 TIME
1423 | |
| 35 RELIABILITY
77-12-11 3643 81 | | | | 36 DATE
77-12-11 | | 37 TIME
1423 | | 38 TOTAL NO. OF FAILURES
1 | |

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528

HUGHES

SPACE AND COMMUNICATION GROUP
FAILURE REPORT

F 1329

| | | | | | | | | | | | | | | | | | |
|---|--|--|--|---|--|---------------------------------|--|-----------------------------------|--|------------------------------------|--|------------------------------------|--|---|--|---|--|
| 1. PROGRAM NAME AND NUMBER
T.M. HS 236 | | 2. S/N
E330 | | 3. MODEL
4 | | 4. TIME OBSERVED
1500 | | 5. DATE OBSERVED
2-4-81 | | | | | | | | | |
| 6. HARDWARE LEVEL WHEN FAILURE WAS OBSERVED
<input type="checkbox"/> SPACECRAFT <input type="checkbox"/> SUBSYSTEM <input type="checkbox"/> ASSEMBLY <input type="checkbox"/> MODULE <input type="checkbox"/> CARD | | <input type="checkbox"/> SYSTEM <input checked="" type="checkbox"/> UNIT | | <input type="checkbox"/> SUBASSEMBLY | | <input type="checkbox"/> MICAM | | <input type="checkbox"/> PART | | | | | | | | | |
| EQUIPMENT IDENTIFICATION | | | | | | | | | | | | | | | | | |
| 7. SUBSYSTEM | | | | NAME | | PART NUMBER | | S/N | | | | | | | | | |
| 8. UNIT | | | | | | 3533002-100 | | 4 | | | | | | | | | |
| 9. <input type="checkbox"/> ASSEMBLY <input type="checkbox"/> SUBASSEMBLY | | | | | | | | | | | | | | | | | |
| 10. <input type="checkbox"/> MODULE <input type="checkbox"/> MICAM <input type="checkbox"/> CARD | | | | | | | | | | | | | | | | | |
| 11. OTHER | | | | | | | | | | | | | | | | | |
| 12. TEST WHEN FAILURE WAS OBSERVED
<input type="checkbox"/> DEVELOPMENT <input type="checkbox"/> QUALIFICATION <input type="checkbox"/> INFORMATION <input type="checkbox"/> AUTHORITY OPERATIONS | | | | <input type="checkbox"/> IN PROGRESS <input checked="" type="checkbox"/> ACCEPTANCE <input type="checkbox"/> SYSTEM | | | | | | | | | | | | | |
| 13. ENVIRONMENT WHEN FAILURE WAS OBSERVED
<input type="checkbox"/> AMBIENT <input type="checkbox"/> RADIATION <input type="checkbox"/> TEMPERATURE <input type="checkbox"/> THERMAL JAR | | | | <input type="checkbox"/> VIBRATION <input type="checkbox"/> HUMIDITY <input type="checkbox"/> OTHER | | TFE H | | | | | | | | | | | |
| 14. DESCRIPTION OF FAILURE | | | | CROSS-SCAN RMS EXCEEDED SPEC. (-2.0). REQ. (U.S. 1420) IN | | | | | | | | | | | | | |
| 15. TEST PROCEDURE
TS 32015-004 4341 | | | | | | | | | | 16. ORIGINATOR
R. Sch... | | 17. DATE
17-31-75 2-6-81 | | 18. CONTINUATION SHEET USED
<input type="checkbox"/> | | | |
| 19. ANALYSIS AND FAILURE ANALYSIS
TESTS INDICATE POSSIBILITIES OF 21.4800 ERROR IN LENGTH TERM RE-
MOUNTED FROM CROSS-SCAN IFMR PROFILES DUE TO DRIFT/INFLUENCE TEMP. COEFFICIENTS. EO
APPLIES A TEST IN CALIBRATION TO INSURE TEMP. STABILITY (OF TEST EQUIP). ADDITIONAL VARIATIONS IN
LENGTH TERM MAY BE AN INTERMITTENT FLEX POINT PHENOMENON. N/A (TEST EQUIP) | | | | | | | | | | | | | | | | | |
| 20. <input type="checkbox"/> REPEAT TEST PROCEDURE. REPEAT TFE H 2 BEYOND (EXCLUDING TFE J).
REF HS 236-2043 | | | | | | | | | | | | | | | | | |
| 21. AUTHORIZATION
P.R. K... | | | | | | | | | | | | | | 22. DATE
17-31-75 2-6-81 | | 23. CONTINUATION SHEET USED
<input type="checkbox"/> | |
| 24. REMARKS | | | | | | | | | | | | | | | | | |
| 25. TEST | | | | | | | | | | | | | | | | | |
| 26. LIST ALL PARTS REPLACED | | | | | | | | | | | | | | | | | |
| PART NUMBER | | | | | | | | | | | | | | | | | |
| CMT SVN | | | | | | | | | | | | | | | | | |
| PART S/N | | | | | | | | | | | | | | | | | |
| DATE CODE | | | | | | | | | | | | | | | | | |
| VGR | | | | | | | | | | | | | | | | | |
| POSSIBLE DEFECT | | | | | | | | | | | | | | | | | |
| ANALYSIS | | | | | | | | | | | | | | | | | |
| 27. REMARKS | | | | | | | | | | | | | | | | | |
| 28. DATE | | | | | | | | | | | | | | | | | |
| 29. RETESTED | | | | | | | | | | | | | | | | | |
| 30. DATE | | | | | | | | | | | | | | | | | |
| 31. CONTINUATION SHEET USED ☐ |
<input type="checkbox"/> | | | | | | | | | | | | | | | | | |
| 32. CAUSE AND CORRECTIVE ACTION
EO 564796
EO ADDS TEST TO INSURE CROSS-SCAN IFMR (TEST EQUIP) THERMAL STABILITY. | | | | | | | | | | | | | | | | | |
| 33. ENCLOSURE | | | | | | | | | | | | | | | | | |
| 34. DOCUMENT IMPLEMENTING CORRECTIVE ACTION
EO TO TS 32015-004 | | | | | | | | | | | | | | | | | |
| 35. BASIC CAUSE
<input type="checkbox"/> DESIGN <input checked="" type="checkbox"/> TEST EQUIP <input type="checkbox"/> MFG PROCEDURE <input type="checkbox"/> AIRING ERROR <input type="checkbox"/> UNKNOWN | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> ENVIRONMENTAL <input type="checkbox"/> TEST PROC. <input type="checkbox"/> ASY FIB ERROR <input type="checkbox"/> ROUGH HANDLING <input type="checkbox"/> DEFECT CODE | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> DEFECTIVE PARTS <input type="checkbox"/> TEST SET UP <input type="checkbox"/> WORKMANSHIP <input type="checkbox"/> REAROUT | | | | | | | | | | | | | | | | | |
| 36. FAILURE TYPE
<input type="checkbox"/> PRIMARY <input type="checkbox"/> UNKNOWN <input type="checkbox"/> SECONDARY | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> FAILURE CLASSIFICATION <input type="checkbox"/> CRITICAL <input type="checkbox"/> MINOR | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> FAILURE SEVERITY <input type="checkbox"/> MAJOR <input type="checkbox"/> MINOR | | | | | | | | | | | | | | | | | |
| 37. RESPONSIBLE ENGINEER
P.R. K... | | | | | | | | | | | | | | 38. DATE
17-31-75 2-6-81 | | 39. CONTINUATION SHEET USED
<input type="checkbox"/> | |
| 40. RESPONSIBILITY | | | | | | | | | | | | | | 41. DATE | | 42. CONTINUATION SHEET USED ☐ |
<input type="checkbox"/> | |

ORIGINAL PAGE IS
OF POOR QUALITY

529

HUGHES

HUGHES AIRCRAFT COMPANY

SPACE AND COMMUNICATION GROUP
FAILURE REPORT

F 1330

| | | | | | | |
|---|--|---------------------------------------|-----------------------|---------------------------|----------------------------------|--------------------------|
| 1 PROGRAM NAME AND NUMBER
TM HS236 | | 2 CLA
E330 | 3 MODEL
E-1 | 4 TIME OBSERVED | 5 DATE OBSERVED
3-3-81 | 6 |
| 8 HARDWARE LEVEL WHEN FAILURE WAS OBSERVED
<input type="checkbox"/> SPACECRAFT <input type="checkbox"/> SUBSYSTEM <input type="checkbox"/> ASSEMBLY <input type="checkbox"/> MODULE <input type="checkbox"/> CARD
<input type="checkbox"/> SYSTEM <input checked="" type="checkbox"/> UNIT <input type="checkbox"/> SUBASSEMBLY <input type="checkbox"/> MICAM <input type="checkbox"/> PART | | | | | | |
| EQUIPMENT IDENTIFICATION | | | | | | |
| 7 SUBSYSTEM | | NAME | | PART NUMBER | | 5-N |
| 8 UNIT | | | | 353302-100 | | HAC |
| 9 <input type="checkbox"/> ASSEMBLY <input type="checkbox"/> SUBASSEMBLY | | | | | | |
| 10 <input type="checkbox"/> MODULE <input type="checkbox"/> MICAM <input type="checkbox"/> CARD | | | | | | |
| 11 OTHER | | | | | | |
| 12 TEST WHEN FAILURE WAS OBSERVED
<input type="checkbox"/> DEVELOPMENT <input type="checkbox"/> IN PROCESS <input type="checkbox"/> QUALIFICATION <input type="checkbox"/> ACCEPTANCE <input type="checkbox"/> INTEGRATION <input type="checkbox"/> SYSTEM <input type="checkbox"/> LAUNCH OPERATIONS | | | | | | |
| 13 ENVIRONMENT WHEN FAILURE WAS OBSERVED
<input checked="" type="checkbox"/> AMBIENT <input type="checkbox"/> RADIATION <input type="checkbox"/> VIBRATION <input type="checkbox"/> TEMPERATURE 20°C <input type="checkbox"/> THERMAL VAC <input type="checkbox"/> HRS AT <input type="checkbox"/> OTHER | | | | | | |
| 14 DESCRIPTION OF FAILURE
TURN AROUND TIME EXCEEDED LIMITS 10658.3 MS
SHOULD BE LESS THAN 10658MS; ANOMALY A OUT OF SPEC. 3A'S
THE K-1 (SMEI) HIGH VOLTAGE, 24°C | | | | | | |
| 15 TEST PROCEDURE
TS 32015-004 4.3.5.1 | | 16 ORIGINATOR
R. Schumacher | | 17 ORG
77-71-25 | | 18 DATE
3-3-81 |
| 19 VERIFICATION AND FAILURE ANALYSIS
SPEC LIMIT EXCEEDED VERIFIED BY MCM/ly & Prince | | | | | | |
| 20 <input type="checkbox"/> FOLLOWING REWORK/RETEST REQUIRED
REWORK/RETEST NOT REQUIRED BECAUSE TURN AROUND TIMES ARE STABLE IN NATURAL PROGRAM AND
CHANGING WITH TIME EXCEPT FOR NORMAL WEAR SEE IDC
AND MEASURED VALUES ARE ACCEPTABLE TO SYSTEM ENGINEERING | | | | | | |
| 21 AUTHORIZATION ORG DATE | | | | | | |
| 22 REWORK/RETEST ACTION TAKEN | | | | | | |
| 23 PROCEDURE | | | | | | |
| 24 REWORK | | | | | | |
| 25 RETEST | | | | | | |
| 26 LIST ALL PARTS REPLACED | | | | | | |
| 27 REWORK BY ORG DATE | | | | | | |
| 28 RETESTED BY ORG DATE | | | | | | |
| 29 CAUSE AND CORRECTIVE ACTION | | | | | | |
| 30 | | | | | | |
| 31 | | | | | | |
| 32 DOCUMENT IMPLEMENTING CORRECTIVE ACTION | | | | | | |
| 33 | | | | | | |
| 34 BASIC CAUSE OF VERIFIED FAILURE
<input type="checkbox"/> DESIGN <input type="checkbox"/> TEST EQUIP <input type="checkbox"/> MFG PROCEDURE <input type="checkbox"/> WIRING ERROR <input type="checkbox"/> UNKNOWN
<input type="checkbox"/> ENVIRONMENTAL <input type="checkbox"/> TEST PROC <input type="checkbox"/> ASSY/PKG ERROR <input type="checkbox"/> ROUGH HANDLING <input type="checkbox"/> DEFECT CODE
<input type="checkbox"/> DEFECTIVE PARTS <input type="checkbox"/> TEST SET UP <input type="checkbox"/> WORKMANSHIP <input type="checkbox"/> REAR OUT | | | | | | |
| 35 FAILURE TYPE
<input type="checkbox"/> PRIMARY <input type="checkbox"/> INDUCED <input type="checkbox"/> UNKNOWN <input type="checkbox"/> NO FAILURE | | | | | | |
| 36 FAILURE CLASSIFICATION
<input type="checkbox"/> CRITICAL <input type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> SAFETY | | | | | | |
| 37 RESPONSIBLE ENGINEER ORG DATE | | | | | | |
| 38 SPACECRAFT SYSTEM ENGR ORG DATE | | | | | | |
| 39 RELIABILITY ORG DATE | | | | | | |
| 40 CUSTOMER OR SUPPLIER DATE | | | | | | |

**SPACE AND COMMUNICATION GROUP
EQUIPMENT CHECKOUT
FAILURE REPORT
CONTINUATION SHEET**

HUGHES AIRCRAFT COMPANY

FR SERIAL NO. F1330

ADDITIONAL FR
CONTINUATION
SHEET(S) USED

2 3-9-81; TURNAROUND TIME FOR BUMPER A EXCEEDS UPPER LIMIT OF 10658 NS; MEASURED: 10670.2 NS; OUT OF SPEC BY 12.2 NS. THE R-9 (SMEI) NORMAL VOLTAGE 240C.

3 3.9-B; TURN AROUND TIMES FOR BUMPERS A & B EXCEEDS LIMITS.
Bumper A: upper limit: 10698.0 μ s; MEASURED 10644.6 μ s; OUT by 53.4 μ s
Bumper B: lower limit: 10553.5 μ s; MEASURED 10515.4 μ s; OUT by 38.1 μ s
TEE R-16 (SME 2) NORMAL VOLTAGE, 24.0°C